EDITORIAL STAFF

E. L. Shaner
Editor-in-Chief

E. C. Kreutzberg
Editor

A. J. Hain
Managing Editor

E. F. Ross
Engineering Editor

Guy Hubbard
Machine Tool Editor

D. S. Cadot
Art Editor

ASSOCIATE EDITORS

G. H. Manlove — J. D. Knox
W. G. Gude — G. W. Birdsall
W. J. Campbell

New York
I. H. Such — B. K. Price
L. E. Browne

Pittsburgh — R. L. Hartford
Chicago — J. F. Powell
Detroit — A. H. Allen
Washington — L. M. Lamm

London
Vincent Delport

BUSINESS STAFF

G. O. Hays
Business Manager

C. H. Bailey
Advertising Service

New York . . E. W. Kreutzberg, B. C. Snell
Pittsburgh . . . S. H. Jasper
Chicago . . . L. C. Pelott
Cleveland . . . R. C. Jaenke, D. C. Kiefer

J. W. Zuber
Circulation Manager

MAIN OFFICE

Penton Building, Cleveland

BRANCH OFFICES

New York . . . 110 East 42nd St.
Chicago . . Peoples Gas Building
Pittsburgh . 1800 Koppers Building
Detroit . . 1010 Stephenson Building
Washington . National Press Building
Cincinnati . . . 282 Sinton Hotel
San Francisco . . 1100 Norwood Ave.
Oakland, Calif., Tel. Glencourt 7559
London . . . Caxton House, Westminster, S.W. 1
Berlin . Berlin, N.W. 40, Roonstrasse 10

• ● •

Published by The Penton Publishing Co., Penton Building, Cleveland, Ohio. John A. Penton, Chairman of Board; E. L. Shaner, President and Treasurer; J. R. Dawley and G. O. Hays, Vice Presidents; F. G. Steinebach, Secretary.

Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States, Cuba, Mexico and Canada, one year $4, two years $6; European and foreign countries, one year $10. Single copies (current issues) 25c.

Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1939 by the Penton Publishing Co.

STEEL

ESTABLISHED 1882

Contents

Volume 104—No. 25 **June 19, 1939**

READER COMMENTS 17
AS THE EDITOR VIEWS THE NEWS 21
NEWS
- The American Destiny 23
- Metalworking Plants Reduce Inventories in May 26
- Steelworks Operations for Week 27
- British Steel Production at Record High 27
- May Gear Sales Up 6 Per Cent 27
- Charges "Smear" by Labor Board 28
- French, English Industries Busy 28
- Metals in "World of Tomorrow" 29
- Scrap Consumption Off 44 Per Cent Last Year 29
- Men of Industry 30
- Obituaries 31
- Aviation 35

WINDOWS OF WASHINGTON 33
MIRRORS OF MOTORDOM 37
EDITORIAL—Trend Is Toward Curbs on Labor Abuses 40
THE BUSINESS TREND
- Index of Activity Rebounds Sharply After Holiday Week 41
- Charts and Statistics 42-43

TECHNICAL
- "What Price Pounds" for Modern Machine Tools? 44
- Nut Thread Tolerances 46
- Large Ladles Are All-Welded 62
- Millionths of an Inch in Gage Room 69

MATERIALS HANDLING
- Classifying 52

METAL FINISHING
- Plating Aluminum 56

JOINING AND WELDING
- Carbon Aids Welding 60

PROGRESS IN STEELMAKING
- Enlarges Cold Mill 64

POWER DRIVES
- Punch Press Drives 70

NEW METAL PRODUCTS 73
INDUSTRIAL EQUIPMENT 76
HELPFUL LITERATURE 77
MARKET REPORTS AND PRICES 81
- The Market Week 82

BEHIND THE SCENES 94
CONSTRUCTION AND ENTERPRISE 100
INDEX TO ADVERTISERS 108

PRODUCTION • PROCESSING • DISTRIBUTION • USE

SERVICED STEELS

LET THE EYE OF AN EXPERT . . .

Solve Your Problem

B & L COLD FINISHED BAR STEELS are *twice serviced* . . . before you buy to assure the proper grade for the job . . . after you buy to enable you to make the best use of it.

B & L engineers are uncovering hidden profits for hundreds of manufacturers by entering the picture at the production stage of the problem, and developing the right steel to achieve quality in the product and economy in fabrication.

A new type shaft that added years to the life of a washer . . . a faster cutting screw stock that nearly doubled output . . . an alloy steel substituted in a tractor part to overcome field hazards . . . a special steel for a diesel engine that solved a machining problem . . . these are a few of many cases where B & L engineers "saved the day" for perplexed steel users.

If you have a steel problem, call in B & L engineers where they can do the most good . . . at the beginning! They have an eye to your interests and make no charge for their experience.

B & L developed a special Cold Finished Steel for this idler shaft, which solved a machining problem and a cost problem at the same time.

BLISS & LAUGHLIN, INC.

HARVEY, ILL. *Sales Offices in all Principal Cities* BUFFALO, N.Y.

COLD DRAWN BARS • GROUND SHAFTING • LEADED STEELS • SCREW STOCK • EXTRA WIDE FLATS • ALLOY STEELS

As the Editor Views the News

■ SEASONAL letdowns in some directions are counterbalanced by activity in others, with the result (p. 81) that the volume of business is practically unchanged. Products now most in demand are tin plate, structural shapes and concrete reinforcing bars. While steel production last week declined 1 point to 52.5 per cent of ingot capacity (p. 27), most indicators are encouraging. Machine tool orders in May (p. 26) were at the highest level since April, 1937. Gear sales (p. 27) were 6 per cent higher in May than in April. STEEL's index of industrial activity (p. 41) has rebounded sharply and stands at the highest level since April 29. Automobile assemblies (p. 37) are in gratifying volume and work on 1940 models is being pushed despite threats of further labor troubles.

♦ ♦ ♦

Stocks Lower

Finished parts inventories dropped rather sharply during the month of May and raw materials stocks declined slightly, according to results (p. 26) of STEEL's survey of recent inventory trends in the metalworking industry. . . . Actuated by a continued flood of new orders for airplanes, the aeronautical industry (p. 35) continues to initiate expansion programs. . . . Steel production in Great Britain in May (p. 27) reached an all-time high level. . . . Tennessee Coal, Iron & Railroad Co. (p. 29) will build a central ore conditioning and sintering plant at Wenonah, Ala. . . . The National Association of Manufacturers (p. 34) has appointed a committee to determine whether any change in our patent system is necessary to aid business. Loans to the railroads for equipment buying are being studied by the government.

♦ ♦ ♦

America's Destiny

In a notable article, re-published in STEEL (p. 23) through permission of *Life*, Walter Lippmann, noted commentator, analyzes the reasons for the depressed state of mind that is so widespread in this country. "The American people," says Mr. Lippmann, "will move forward again, and feel once more the exhilaration and confidence that have made them what they are, when they allow themselves to become conscious of their greatness, conscious not only of their incomparable inheritance but of the splendor of their destiny". . . Ways and means committee on Friday reported the proposed new revenue bill which is expected (p. 33) to be taken up today for consideration by the house. It contains a number of provisions more favorable to business than those of the existing law.

♦ ♦ ♦

Not Price Per Pound

Guy Hubbard, STEEL's machine tool editor, sees no sound reason for thinking of machine tool investments on a price per pound basis. Rather, they should be considered (p. 44) from the standpoint of the profits they make possible when put to work in production lines. . . . William C. Stewart, technical adviser, American Institute of Bolt, Nut and Rivet Manufacturers (p. 46), points out a need for adjusting standard specifications for commercial nut threads that will more nearly represent good practice from the standpoints of manufacturers and users. Close limits, he points out, increase the cost out of all proportion to the slightly improved characteristics obtainable. . . . Superior Steel Corp.'s enlarged cold mill (p. 64) rolls stainless steel sheets up to 30-inch widths.

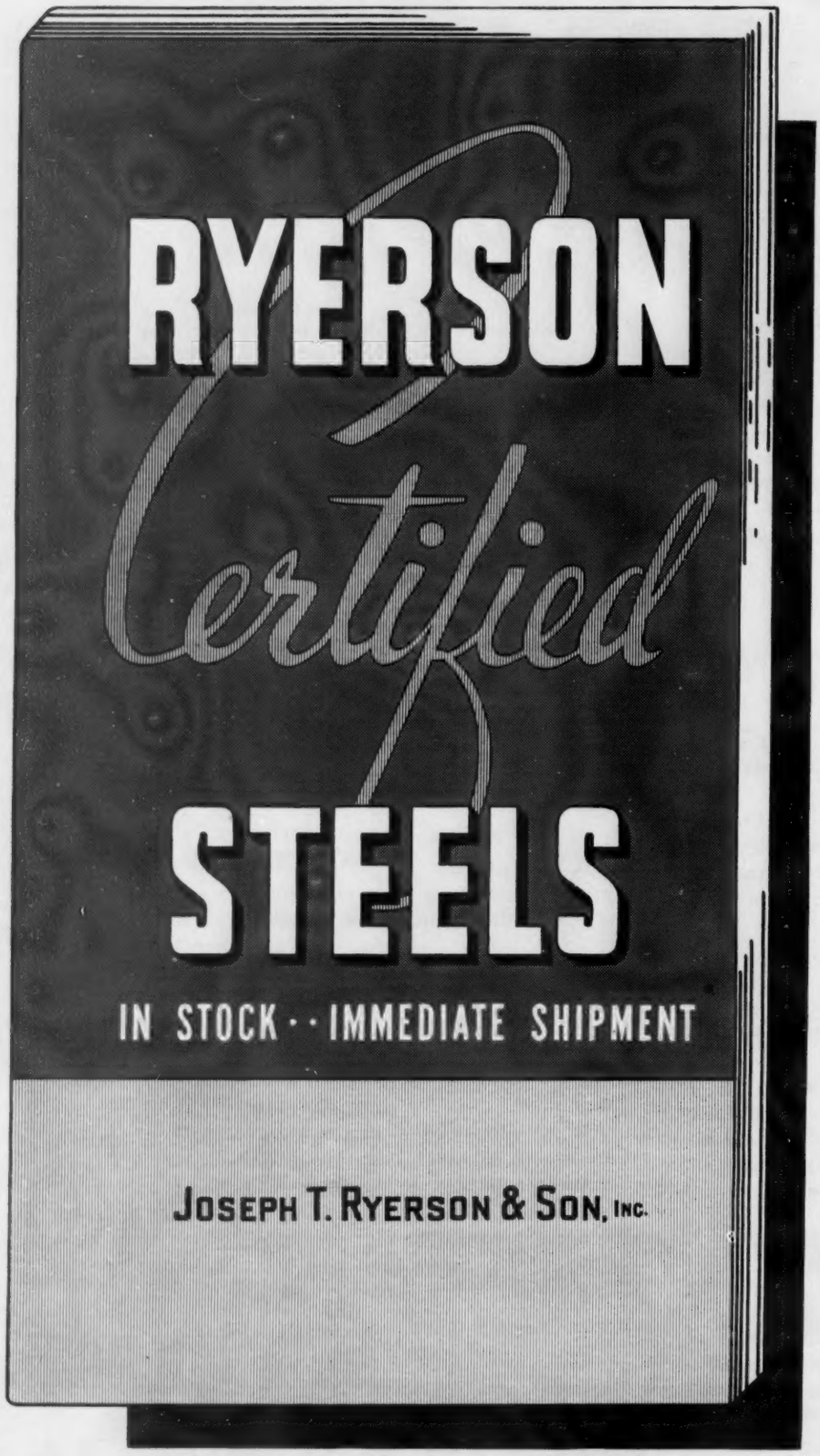
♦ ♦ ♦

New Plating Process

A new process for plating aluminum (p. 56) applies tenacious coatings on aluminum and aluminum alloys in the forms of die castings and wrought and extruded parts, enhancing wear resistance, decorative effect and ease of soldering. . . . Carbon rods, plates and paste are used increasingly (p. 60) to control flow of molten metal in welding operations, with resulting economies. . . . Handling costs in a tin mill products warehouse have been reduced 50 per cent (p. 52) by use of a power fork-type lift truck which triples storage capacity on the same floor space. . . . Variable speed transmissions are being applied increasingly on punch presses; one user (p. 70) finds that they quickly repay their cost through higher operating speeds and increased production.

E C Kreutzberg

The New Ryerson Stock List and Steel Data Book . . .



Complete . . . Convenient
Accurate . . . Easy to Use

This new book makes it easy to check specifications and select the exact kind, size and shape of steel you require. It cuts buying routine, speeds up orders and conserves your time by grouping in the most convenient form the widest range of steel products—more than 10,000 shapes, sizes and kinds—in stock for Immediate Shipment.

New features that make it much easier to secure accurate data on the various steel products are:—

VISUAL TAB INDEX DIVIDERS . . .

Products are grouped in sections with separate index dividers and visual tabs for quick reference.

NEW PRODUCTS . . .

Ry-Alloy, Hi-Steel, Ledloy and many other new products are now carried in stock for Immediate Shipment.

NEW SIZES AND SHAPES . . .

A wider range of bars, shapes, tubing, sheets, alloys, etc. are now in stock.

NEW WEIGHT TABLES . . .

Full length bar weights and other data for quick figuring are included in this new book.

NEW BINDING . . .

Mechanical type binding with oval punching for greater convenience when used flat on desk or in your Ryerson Steel-Service binder.

When you need steel, use the new Ryerson Certified Steel Stock List. It offers you the most complete and most diversified range of products. It gives you weights, lengths, cutting data and other pertinent information on steels of known high uniform quality.

JOSEPH T. RYERSON & SON, INC.

Plants at: Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City

If you have not received your copy of this new book, write us. We shall be glad to forward a copy.

RYERSON *Certified* STEELS

THE AMERICAN DESTINY

BY WALTER LIPPMANN

STEEL herewith reproduces from the June 5 issue of LIFE, by special arrangement with the publishers, an article entitled "The American Destiny," written by Walter Lippmann, noted commentator. Because it is an exceptionally clear and forceful analysis of problems which confront this country, STEEL believes it should be read by everyone, especially those whose thoughts and actions tend to mold the pattern of American life and government. It is such an article which inspires men to appreciate their opportunities; to work together, to do their best.—The Editors

■ A PEOPLE with a long habit of freedom holds securely in its possession the space to live, a fertile soil, invested wealth, the technical arts, everything that a nation could need. Yet something is wanting. And for want of it the American people are profoundly troubled. They know that they are not making the most of their opportunities. They know that for lack of clear purpose and a confident will they are falling far short of what they have a right to expect of themselves. They are not at ease in their consciences. They know that with such resources, such riches, and such power they are stalled, whereas they should be in action against poverty, and the stagnation of enterprise, and the crumbling of law and civilized custom in the world all about them.

The American spirit is troubled not by the dangers, and not by the difficulties of the age, but by indecision. Considering the resources with which nature, and the accumulated achievements of the past, and historic fate have endowed America, there ought to be no question in anyone's mind about the American future. Yet in the generation to which we belong, unlike any that went before, the American people have no vision of their own future. Lacking this, they are seized by deep uncertainty. They are confused by their problems. They are oppressed by doubt. They are living anxiously and unclearly from day to day, feeling that the strength within them is being wasted, is throttled, is suffocated, that they are dedicated to no great ends, that they have no sure faith that enlists the young. This mood will pass. But while it obsesses the American spirit, the people are making themselves sick with nervous indecision.

Three Great Disappointments

The immediate cause of this indecision is, I believe, the accumulated disappointments of the postwar era. Three times in these twenty years the American people have had a great hope and three times they have been greatly disappointed. They believed with Wilson that they could help to make a world that was safe for free men living in peace under just laws. They believed with Coolidge and Hoover that they had arrived at a new era of certain and advancing prosperity. They believed with Roosevelt that they were organizing securely an abundant life for all the people. For the moment they are disillusioned and believe nothing in particular. When they are reminded how great are their resources, how splendid are their achievements, how decisive is their power in the world, they are embarrassed by the opportunities they are not using and by the challenge of a high destiny to which they are not responding.

Far from feeling inspired by the riches of the American earth, the generation to which we belong is now frightened by its fertility. It is as if this continent had raised up something too great for little men to deal with. For twenty years, under the influence of disappointed hopes, the people have worked themselves into a state of mind where today their ideas and their policies are dictated by a dread of the fertility of nature, by fear of the industry, the thrift, the inventiveness and the enterprise of men, by alarm at the prestige and the power of the nation. The attitude of the American people at this moment is one of recoil from those very constituents of greatness which vigorous peoples have hitherto everywhere and always struggled to obtain.

We Seem To Have Too Much

They have let themselves be persuaded that in every phase of their activity they are threatened by the expansion of their power and must contract it, that they must withdraw, retreat, fence in, batten down, plow under, work less, save less, invent less, invest less, and risk nothing. For the moment, this moment of bewildered indecision through which we are now living, the American people are acting on the assumption, though in their hearts they reject it, that their incomparable assets are in fact their most dangerous liabilities.

That this is not a national policy but a national neurosis is evident when we realize that whereas the problems of other nations are the problems of insufficiency, our problems are the problems of superfluity. We seem to have too much of everything. We seem to have too much land. The land seems to

be too fertile. We have taken elaborate measures to reduce the yield, and we do not know how to dispose of the surplus. We seem to have too many factories, and the machinery seems to be too efficient, and we seem to have too much labor. We rack our brains to devise schemes for limiting the output and reducing the work done by the worker. We seem to have too much capital, and we worry about how to reduce our savings and about how not to invest them where they will produce too many goods. We seem to be too inventive, and we study plans for slowing up technological progress. We seem to have too much gold, and we bury it in Kentucky. We seem to have too much influence in the world and we examine devices for making ourselves as unimportant as possible.

We Concentrate on Getting Rid of Surplus

In every field of our activity we have come to think that there is a surplus to be gotten rid of—a surplus of crops, of minerals, of industrial capacity, of gold, of savings, of credit, of labor, and of influence in the world. At the end of these twenty years our farm policy is an attempt to produce less and to dump the surplus. Our industrial policy is an attempt to protect old investments against the competition of new enterprise. Our fiscal policy, as conceived by those who direct it, is an attempt to reduce savings and to sterilize bank deposits and to bury gold. Our labor policy is an attempt to let more men work a little by making each man work less. Our foreign policy is regulated finally by an attempt to neutralize the fact that America has preponderant power and decisive influence in the affairs of the world.

However plausible a case can be made for this measure or that, the total effect is that the American people face the world not with their old confidence and courage, but in a mood of withdrawal, denial, defeat, and of wishing to escape from their opportunities and their responsibilities. This must be a transient mood. This must be the mood of a people whose minds and spirits are not yet adjusted to a radically new situation. Men say no to everything when they have not yet learned how, and have not yet nerved themselves, to say yes. For in the long run it cannot be true that a nation grows rich by not producing, by not working, by not saving, by not investing, by not being enterprising, by seeking only security and stability and protection from risks, by trying to be small and unimportant.

This cannot be the permanent attitude of the nation. It must be a passing mood, the curious mood of a peculiar epoch. For here is this continent, an island lying between two great oceans; the heart of it is invulnerable and the nation can never be conquered or intimidated. Upon this continent or within easy and fritndly reach of it, there is every material resource. The people who inhabit this continent selected themselves as colonists and emigrants out of the civilized nations of Europe: they are adventurous, enterprising, and brave with high faith. They are in full possession of the whole technology of modern science. They inherit an equipment of capital produced by prodigious labor and by immense investment. They have political institutions, which with all their faults in detail, are one of the wonders of the world: nowhere else and never before has so large a population lived in one union on so vast a territory with such security and in such freedom. Nothing that a people could want, nothing that nations fight to obtain, nothing that men die to achieve is lacking, nothing except a clear purpose and the confident will to make the most of all these things.

And why are they lacking? They have never been lacking before. This country has passed through many trying days. But never, in the bleak winter of Valley Forge or on the field of Gettysburg, has it lacked leaders who were confident of its destiny. What is it, then, that has happened to this people in the post-war world that has shaken their confidence? They have not been wrecked by a calamity of nature. They have not been attacked and conquered by an enemy. But for the moment they have lost the conviction that they are moving forward, that they are on their way and are going places.

They have lost their confidence, I submit, because three times in these twenty years they have started off with high hope to do great things that they had never done before, and three times, on the first attempt, they have been disappointed. First, they intervened in a world war, decided the issue, and failed to establish a good peace. Then, they intervened as the creditor to restore the world's economy, and failed. Then, they set out to give themselves a secure and abundant life at home, and they have not yet succeeded. In each movement they began with enthusiasm and they have ended in disillusionment. For the moment, they think they were deluded under Wilson when they saw themselves as the organizers of world peace, under Coolidge when they worked for reconstruction, under Roosevelt when they worked for reform.

Our Insight Is Good but Execution Is Bad

But the American people were not deluded in what they undertook to do in the post-war era. These were the things that still have to be done. They did not succeed on the first attempts because they had not yet acquired the training or the experience that were needed in order to succeed. They were right under Wilson when they recognized that as a result of the war the power and influence of America had grown so great in the world that on the paramount issues the position of the United States, whatever it did or refused to do, was decisive. The insight was true; the execution was gravely defective. Neither Mr. Wilson nor his diplomatic assistants nor the congress nor the people at large had learned how to exercise successfully so much influence in the outer world. The conduct of the foreign policy of a great power requires experienced men. That experience cannot be gotten in a few months or even in a few years.

The American people were right under Coolidge when they recognized that as a result of the war they had become the strongest creditor power, and that this gave them a vital interest and a clear obligation to take a leading part in the reconstruction of the money and the credit and the commerce of the world. But the American bankers and American

legislators of the twenties had had almost no experience in such affairs; American business men had not yet learned to understand the difference between the commercial policy of a debtor nation and that of a creditor nation.

And under Roosevelt the American people were right when they recognized that the time had come when the nation must organize itself to control the violence of booms and depressions, must take measures to preserve its agriculture and to restore the soil and to conserve natural resources, must guarantee to all men an opportunity to work, must provide security for the young, the old, the sick anl the handicapped. But the wisdom to do all these things was not equal to the need for doing them. Mr. Roosevelt's New Dealers were as untrained and ill-equipped to design and administer these reforms as had been Mr. Wilson's diplomats and Mr. Coolidge's financiers.

For the moment, therefore, a large part of the people have concluded that in each of these three undertakings of the post-war era the objective was wrong. They look upon the tragic consequences of Versailles as proof that it was a mistake to attempt to organize the world for peace under the reign of law. They look upon the crash of 1929 and the defaulted bonds and the wasted savings as proof that it is a mistake for the world's creditor to extend credit. They look now with dismay upon the unending deficits and the millions of unemployed and the stagnation of business. These failures and disappointments have for the time being turned a substantial majority against domestic reforms, against general reconstruction, and against organized peace. They have produced the thoroughly disillusioned American of the present day who wants to withdraw within the three-mile limit, wants to bury the gold, and wants to suspend the reforms.

We Refuse To Go on with Things We Started

No doubt this reaction is human enough. But a completely reactionary state of mind is hardly suited to cope successfully with the problems of a dynamic age. On the contrary, the more we have refused to go on with the things we undertook to do, and failed to achieve, the more compelling and urgent do these tasks become. Twenty years ago the congress refused to proceed with the difficult work of organizing the world for peace. The refusal has not settled the issue. It is more acute today than it ever was before, and never in time of peace has the United States had to arm on such a scale as it is arming today. Ten years ago we refused to go on with the task of reconstructing the shattered economy of the world. The refusal has not made easier, in fact it has aggravated, the difficulty of reconstructing our own domestic economy. Now we are at the point where a considerable number of the voters think they would like to put an end to social reforms. If these views prevail, we shall soon find that the discontent makes necessary even more drastic social reforms.

Above all we are finding that when a nation refuses to do the great things which it has to do, it is unable to do the littler things that it wishes to do. The refusal to accept the large responsibilities is demoralizing. Men who will not face the big things become generally nervous and fearful in all things. The attitude of negation, of not producing, not working, not saving, not investing, not competing, not trading, not exercising influence, is simply the morbid rationalization of the general refusal to accept the American destiny in the post-war world.

That is what ails us today. In the lifetime of the generation to which we belong there has occurred one of the greatest events in the history of mankind. The controlling power in western civilization has crossed the Atlantic. America, which was once a colony on the frontiers of Europe, is now, and will in the next generations become ever more certainly, the geographic and economic and the political center of the Occident. All the world knows this and acknowledges it. The American people have known it under Wilson, under Coolidge, under Roosevelt, in their great undertakings after the World war. They were following the American destiny. And, with all its risks, all its responsibilities, all its anxieties, after all the disappointments and failures, they will have to go on with it. There is no way to refuse this destiny.

America Will Lead World Tomorrow

What Rome was to the ancient world, what Great Britain has been to the modern world, America is to be to the world of tomorrow. We might wish it otherwise. I do. Every man who was young in the easier America of the pre-war world must long for it at times. But our personal preferences count for little in the great movements of history, and when the destiny of a nation is revealed to it, there is no choice but to accept that destiny and to make ready in order to be equal to it.

The indecision which paralyzes us today will not be ended by reassuring statements from the White House, or by little changes in this or that policy, or by a change of party control. The indecision which pervades the American spirit, and manifests itself in the policies of plowing under, not producing, not saving, not investing, has its root in the refusal by the American people to see themselves as they are, as a very great nation, and to act accordingly. We are negative today in all things because we have shrunk from being positive in the big things. We are undecided, nervous and torn because we are confronting the problems of the twentieth century with minds formed in the nineteenth century, and attached to the smaller duties of a simpler past. We are afraid of the fertility of the American earth, afraid of the productiveness of American capital and American labor, afraid of American influence in the family of nations, because we still cling to the mentality of a little nation on the frontiers of the civilized world, though we have the opportunity, the power, and the responsibilities of a very great nation at the center of the civilized world.

The American people will move forward again, and feel once more the exhilaration and the confidence that have made them what they are, when they allow themselves to become conscious of their greatness, conscious not only of their incomparable inheritance but of the splendor of their destiny. Then the things that seem difficult will seem easy, and the willingness to be equal to their mission will restore their confidence and make whole their will.

Metalworking Plants Reduce Raw Materials, Finished Parts Stocks

■ METALWORKING companies reduced finished parts inventories rather sharply from April 30 to May 31, while raw materials stocks declined only slightly, a survey of representative firms by STEEL indicates.

Forty-two per cent of the companies covered reduced stocks of finished parts; 26 per cent reported no change; and 32 per cent increased finished parts on hand.

Thirty-five per cent had less raw materials on hand at the end of May than at the beginning; 32 per cent held stocks constant; 33 per cent increased raw materials stocks.

These data are contained in replies to questionnaires addressed to presidents of medium-sized metalworking companies in every geographic section. The questions:

1. How much was your raw materials inventory value on May 31 above (or below) that on April 30?
2. How much was your finished parts inventory on May 31 above (or below) that on April 30?
3. At your present rate of operations, how long will your raw materials inventory last?

Thirty-two per cent of the companies replying said raw materials on hand would last less than 31 days; 62 per cent reported supplies insufficient for two months.

Of those with larger raw materials stocks, 14 per cent estimated supplies would last two to three months; 18 per cent, three to six months; 4 per cent, six to nine months; and less than 2 per cent had enough raw materials to last more than nine months.

Inventory reductions were attributed partially to seasonal influences by some fabricators, who normally expect a seasonal lull during the summer. A few said they were reducing stocks in preparation for June 30 inventories and accounting.

Others stated they took advantage of concessions in steel prices during the early part of May and increased stocks. One fabricator doubled raw materials stocks, commented: "Steel price down. Took advantage of price and loaded up."

How stocks, raw materials and finished parts fluctuated is shown in the following table:

Inventory Movement	Raw Materials	Finished Parts
(All figures in percentages)		
Up 25 or more	5.6	7.2
Up 10-24	12.5	8.7
Up 1-9	15.3	15.9
Unchanged	32.0	26.1
Down 1-9	15.3	23.2
Down 10-24	16.6	14.5
Down 25 or more	2.7	4.4

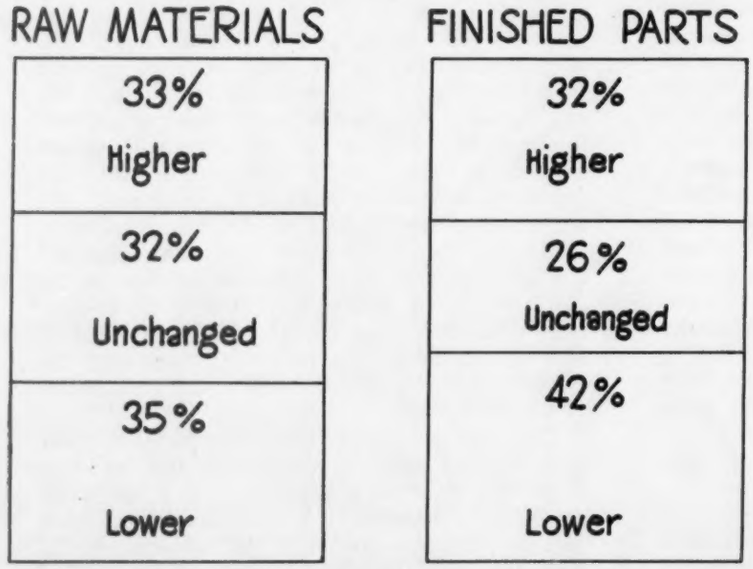
Optimistic notes, accompanying returned questionnaires: "Re-ordering every week as our inventories are low. We have only about a month or six weeks' inventory on hand and this really is too small for a working inventory."

Another comments: "Our business is up about 17 per cent. We expect it to hold that level in June. We have no excess stocks."

A Mid-Westerner reports: "Our steel and wire consumption will run 35 per cent over 1938."

Still another finds "prospects good, with new business immediately pending." He complains, however, that "business lacks pep in its dealings today. Everyone is listless and has to be pressured. Deliveries very poor from our sources."

As Plants Reported Trend of Inventories in May



■ Finished parts inventories were reduced in May by 42 per cent of the metalworking firms replying to STEEL'S questionnaire; increased by only 32 per cent, the remainder being unchanged. Thirty-five per cent of companies reduced supplies of raw materials, while 33 per cent increased their stocks

Machine Tool Orders Reach 25-Month Peak

■ May machine tool orders were the highest since April, 1937, according to the National Machine Tool Builders' association, Cleveland. Increase in both domestic and foreign orders carried the association's index to 219.8, compared with 155.6 in April and 66.7 in May, 1938.

Three months average index is 186.9.

Orders for foreign delivery for the first five months this year are heavier than for the comparable period in 1937, and represent a larger share of the total.

Domestic business for past five months is 43 per cent above the total for the last five months of 1938.

Steel Corp. Shipments Up 3 Per Cent in May

■ United States Steel Corp.'s finished steel shipments in May amounted to 723,165 tons, 21,706 tons, or 3 per cent, more than 701,459 tons in April. Compared with 465,081 tons shipped in May, 1938, the increase was 258,084 tons, or 55.4 per cent.

Five months' shipments this year totaled 3,659,833 tons, 1,127,536 tons larger than 2,532,297 tons in the first five months last year.

U. S. STEEL CORP. SHIPMENTS
(Inter-company shipments not included)

	(Tons)			
	1939	1938	1937	1936
Jan.	789,305	518,322	1,149,918	721,414
Feb.	677,994	474,723	1,133,724	676,315
March	767,910	572,199	1,414,399	783,552
April	701,459	501,972	1,343,644	979,907
May	723,165	465,081	1,304,039	984,097
June	.....	478,057	1,268,550	886,065
July	.....	441,570	1,186,752	950,851
Aug.	.....	558,634	1,107,858	923,703
Sept.	.....	577,666	1,047,962	961,803
Oct.	.....	663,287	792,310	1,007,417
Nov.	.....	679,653	587,241	882,643
Dec.	.....	694,204	489,070	1,067,365
Adj.*	.....	‡30,381	†77,113	†40,859
Total	.....	6,655,749	12,748,354	10,784,273

*Yearly adjustment. †Deduction. ‡Increase.

British Steel At Record High

■ GREAT BRITAIN'S steelmakers established a new production record in May, making 1,218,100 gross tons of steel ingots and castings, as reported in STEEL's cablegram, page 98. This was an increase of 39,800 tons over the previous peak output, 1,178,300 in November, 1937.

British steel production first passed 1,000,000 tons per month in 1936: September, 1,027,000 tons, and October 1,060,500 tons, each a new high. In March, 1937, the tonnage reached 1,109,500, and in September that year, 1,163,000.

Total production in 1937 was the largest in the history of the British industry, 12,964,000 gross tons. This may be exceeded in 1939 on the basis of present conditions. Five months' total is 5,230,000 tons. Output in all 1938 amounted to 10,393,800 tons.

A report to the department of commerce from its London office states early months this year found commercial demand for steel was light because of political uncertainty.

Recent European developments have brought about a complete change and heavy government orders for air-raid shelters and other war materials have caused capacity operation. Shipbuilding also has increased greatly under government assistance.

Consumers fear a repetition of the shortage experienced in 1937 and are placing protection orders. Sheet demand greatly exceeds supply and purchases are being made on the Continent. Imports are being increased. Scarcity of scrap has caused greater use of pig iron in steel production. During the first quarter 17 blast furnaces were added, 12 being engaged in producing iron of the various steelmaking grades.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended June 17	Change	Same week 1938	Same week 1937
Pittsburgh	40	— 3	23.3	92
Chicago	49.5	— 3	22	63.5
Eastern Pa.	37	None	26	67
Youngstown	52	+ 1	27	30
Wheeling	73	None	35	93
Cleveland	55.5	+ 2.5	31	46
Buffalo	44	None	28	89
Birmingham	71	+ 4	58	83
New England	40	None	25	82
Cincinnati	73	+ 5	28	93
St. Louis	42	— 5	39.3	93
Detroit	57	None	21	97
Average	52.5	— 1	27	75.5

May Gear Sales Up 6 Per Cent

■ GEAR sales in May were 6 per cent higher than in April, according to the American Gear Manufacturers' association, Wilkinsburg, Pa. The association's index (1928 representing 100) rose five points to 93.

Compared with May, 1938, the improvement is 33 per cent, the index in that month being 70.

First five months of 1939 reflect a gain of 14 per cent over the same period last year.

"It is recognized that gearing is intimately related to practically every industry," comments the association, "and for this reason the trends in the gear industry form a dependable barometer as to industrial trends in general."

The association's data on gear sales are obtained from merchant sources and do not include gears for mass production consumer goods, such as automobiles. The monthly index figures, with graph, through arrangement with the association, hereafter will appear regularly in STEEL.

Index Showing Trend of Gear Sales from 1928

(Year 1928 = 100%)

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total (Per ct.)
1939	91	86	104	88	93	...	...	...	...	...	...	...	...
1938	93	77	91	74	70	58	67	76½	80½	72½	72	81	76
1937	144	130½	195	164	125½	134	124	125	123	139½	127½	97	135½
1936	90½	93	92	105	105	105	107½	113	115½	112	122½	132½	107½
1935	65½	63½	64½	68½	75½	66½	78½	95	78	77½	69½	80	73½
1934	43	44	58	52	55½	58	55	59	54	50	50½	57	53
1933	26	23½	26	26	58	73	62	57	47	47	47	46	43½
1932	32	41	36	28	23	27	27	32	28	27	25	30	30
1931	65	73	62	62	93	55	69	52	45	38	35	42	57½
1930	97	95	109	102	106	100	104	106	100	98	96	98	99½
1929	124	121	140	131	137	129	134	137	129	126	123	126	128½
1928	97	95	109	102	106	100	104	106	100	98	96	98	100

PRODUCTION

■ STEELWORKS operations last week declined 1 point to 52.5 per cent. Increases were noted in four districts and declines in three; five were unchanged. Year ago the rate was 27 per cent, two years ago 75.5 per cent.

Youngstown, O.—Gain of 1 point to 52 per cent. This week the rate is scheduled to move up 4 points to 56 per cent, as all producers add open hearths to a total of 48 and bessemer operation is increased to 12 turns per week.

Birmingham, Ala.—Up 4 points to 71 per cent. Republic Steel Corp. added its fifth open hearth at Gadsden, Ala. Tennessee company has lighted a blast furnace at Ensley works.

Detroit—Unchanged at 57 per cent for the fourth consecutive week.

Pittsburgh—Down 3 points to 40 per cent.

Wheeling—Steady at 73 per cent, all interests continuing production to meet consumer demand.

Central eastern seaboard—Continues at 37 per cent with no indication of change for remainder of month.

Buffalo—Holding at 44 per cent for the third week.

New England—Remains at 40 per cent but will drop to 30 per cent this week, one unit taking off all open hearths until July 10.

St. Louis—Declined 5 points to 42 per cent. Some plants expect further curtailment this week.

Chicago—Receded 3 points to 49.5 per cent. Sharp reduction by one steelworks offset gains by two smaller mills.

Cincinnati—Reached a new high for the year at 73 per cent, a 5-point gain. Part of current output is in anticipation of a shutdown by one mill next month.

Cleveland—Rose 2.5 points to 55.5 per cent, best rate in 16 weeks.

Carpenter Steel Marks Fiftieth Anniversary

■ Carpenter Steel Co., Reading, Pa., celebrated its fiftieth anniversary recently with a banquet attended by all executives and the entire sales force.

First steel was made June 7, 1889, six days after the company's organization. The old Philadelphia & Reading rail mill had been leased for preliminary operations and in November the Union Foundry was purchased and production moved there, the site of the present plant. By the end of the year the payroll numbered 62. Present number of employes is 1221, of whom 101 have been in the company's service 25 years or more.

Charges "Smear" By Labor Board

WASHINGTON

■ COUNSEL for the American Rolling Mill Co., Robert T. Caldwell, appeared last week before the senate committee on education and labor, now holding hearings in connection with the Wagner labor act.

During his testimony, Mr. Caldwell discussed in considerable detail the case the national labor relations board has against the company. He charged NLRB agents have made "deliberate attempts to smear a reputable employer."

The question involving the Ashland, Ky., plant of the company still is before the board.

Mr. Caldwell cited a statement by Philip G. Philipps, NLRB regional director, who filed the complaint, that it was one of the most sweeping ever undertaken by the board.

He recounted the incidents leading up to an election conducted at the Butler, Pa., plant of the company to determine whether the CIO should be designated the bargaining agent for its employes, and the resultant defeat of the CIO by 3 to 1.

Made Sensational Charges

"During the negotiations concerning this election in the Butler plant," Mr. Caldwell continued, "rumors were current that if the CIO failed to win the board would file a complaint against the company at Ashland and throw out the representation plan there. These rumors increased after the election, and on May 28, 1938, Mr. Phillips phoned me from Cincinnati, saying he had received from the labor board a complaint against the company and extended to me the usual invitation to come to his office to discuss the matter. He asked if I would accept service of the complaint there in order to avoid publicity. I agreed to this and we made an engagement for me to call on him following my arrival from Ashland.

"However, before my meeting with Mr. Phillips, he had called in the representatives of the press, given them copies of the complaint which had not yet been served, and issued a release of a highly inflammatory nature against American Rolling Mill Co. Charges in the regional director's press release included: Agents of the company had 'assaulted and brutally beaten' organizers; had broken into union offices and stolen records; had dominated the municipal government and civic organizations of the city; had caused the publication of antiunion news items; and had co-operated with other employers and associations in antiunion activities. At the hearing these chargese were withdrawn from the board's complaint and no effort made to prove them."

F. H. Fowler, president of Foote Bros. Gear & Machine Corp., Chicago, also appearing before the committee, stated the national labor relations board had required him to employ for a hearing a board-approved stenographer who charged $1 a page for a 3250-page record.

Rules Two Cold-Rolling Patents Are Valid

■ Validity of two patents owned by the Cold Metal Process Co., Youngstown, O., covering a process for cold rolling steel was upheld by the United States circuit court of appeals at Philadelphia in a decision given last Friday. The court held Carnegie-Illinois Steel Corp. and the United States Steel Corp. had infringed these patents. Three companion patents were declared invalid on the ground their ideas involved only "engineering skill" and not "inventive genius."

Damages to which the court ruled the Cold Metal Process Co. is entitled will be determined by a special master to be appointed by the federal court of New Jersey, where the litigation orifiinated. In the earlier suit filed by the Youngstown company, four of the five patents were held invalid and one valid. Cold Metal appealed from the invalidation of the four patents, while the Steel corporation appealed from the decision it had infringed the other patent.

Monarch To Hold Open House at New Plant

■ Completion of its new factory and office building will be celebrated by Monarch Machine Tool Co., Sidney, O., with open house June 24 and 25.

Following a dinner meeting on Friday, 400 members of the National Association of Foremen will preview the modern air-conditioned plant. To be held in Monarch's new auditorium, the dinner will be addressed by Capt. A. A. Nichoson, personnel manager of the Texas Corp.

Several thousand visitors are expected during the open house, whose feature is an exhibit demonstrating how machine tools have made possible modern civilization's high standard of living. Many leading equipment manufacturers are participating.

This expansion has increased Monarch's floor space 35 per cent to 135,000 square feet, brings employment to the highest level in its history.

French, English Industries Busy

■ CLIFFORD S. STILWELL, vice president, the Warner & Swasey Co., Cleveland, who visited Europe last October and November, has just returned from another trip abroad which included France and England.

Mr. Stilwell was impressed by the abrupt change that has occurred in the attitude of the French and British people during the seven months elapsing between his visits. Last fall, France was torn by internal dissension. Labor was in a sullen mood. The nation seemed to have no settled policy and the people were troubled by indecision. At the same time, England was suffering from confusion as to national policy and from increasing anxiety as to the outcome of continental disturbances.

Today, according to Mr. Stilwell, most of the signs of muddled purpose, indecision and internal conflict have disappeared. Instead one finds the people of both nations working with determination and united effort toward definite objectives.

Work-Week Longer

In France all thought of the 40-hour week has disappeared and workmen are engaged up to as high as 55 hours a week. In England, Mr. Stilwell found new industrial buildings going up at an unprecedented rate. These new plants are being constructed substantially and are being equipped with the latest, most efficient machinery. British authorities believe England's production of material and equipment for preparedness either has passed or will pass before July Germany's output in this respect.

In spite of the fact England is putting forth every effort to prepare itself for any emergency, its manufacturers are being careful to preserve their foreign markets. In France, Mr. Stilwell found French plants are buying machine tools from England on five or six weeks delivery. At the same time, British manufacturers—unable to build enough machine tools for their foreign trade as well as for the needs of their domestic preparedness program—are buying machine tools in America at higher prices and upon extended deliveries to make up the deficiency. This, in the opinion of Mr. Stilwell, is a good illustration of the traditional acumen of the British in foreign trade.

He believes that United States machine tool builders will continue to receive considerable volume of business from England.

Metals in "World Of Tomorrow"

NEW YORK

■ WHAT metals will mean in tomorrow's world is dramatically portrayed for World's fair visitors at the "Hall of the Future," featured exhibit of United States Steel Corp. subsidiaries in the corporation's stainless steel building.

Projecting today's discoveries into possible applications of the future, scientists have built in panoramic form the highway, farm, factory, city and home of tomorrow. Modeled to exact scale are radio-operated farms, prefabricated houses with rooms sliding in place like desk drawers, and elevated pneumatic tubes, speeding travelers by air pressure.

The story of steel today—foundation for tomorrow—is related by the exhibit with animated dioramas offering close-up views of modern steel production. Details are depicted, from iron ore mining to rolling finished products.

Views are particularly intended to convey the magnitude of mill operations, the ease and assurance of handling hundred-ton loads. To permit visitors to enjoy the spectacular beauty of molten metal during pouring, the dioramas showing such scenes at blast furnace and open hearth are accompanied by dazzling lighting effects.

Keyed to the corporation's exhibit theme, "Steel Thinks Ahead", its "Hall of Research" describes the constant search for new fields of service for man's most useful metal, tells how intensive study of steel's properties enable the steelmaker to control its production in a thousand different forms.

Throughout the hall are practical demonstrations of the unusual performance of the "controlled steels" so essential to modern industrial development.

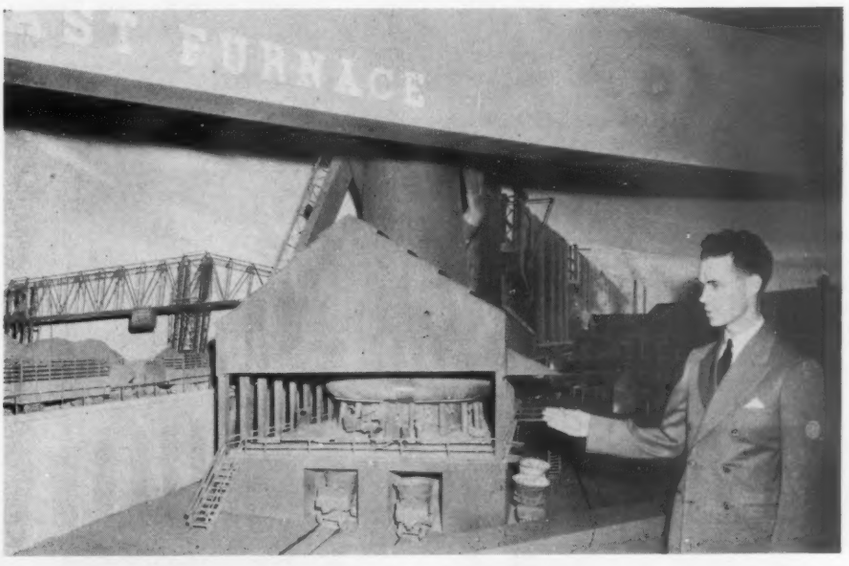
T.C.I. To Build Central Ore Conditioning Plant

■ Tennessee Coal, Iron & Railroad Co. soon will start construction of a central ore conditioning and sintering plant at Wenonah, Ala.

When the plant is completed late next year, ore crushing at individual mines will be discontinued. Ore will be loaded directly into railroad cars at the mines and taken to the central plant, where it will be dumped into a primary crusher. Belt conveyors will carry it to a second crushing station for final reduction.

Leaving the secondary crusher, ore will go to a screening and continuous sampling station where it will be separated into coarse, medium or fine sizes. Coarse and medium grades will be stored in steel silos, and chemical analyses made before removal to blast furnaces. Fine grade ore will be conveyed from screening station to storage bins at the sintering plant. Flue dust and coke braize will be stored in adjacent bins. Part of the fine ore will be mixed with these and sintered.

Some alterations of ore stocking facilities at the company's Fairfield blast furnaces will be required to co-ordinate the ore conditioning program.



■ **"How steel is made" is depicted by United States Steel subsidiaries in their New York World's fair exhibit. Moving dioramas, 1/25 actual size, reproduce each operation. Shown above is the blast furnace replica**

1938 Scrap Use Off 44 Per Cent

■ DOMESTIC consumption of steel and iron scrap in 1938 totaled 21,344,934 gross tons, 44 per cent less than 38,006,272 tons in 1937, according to compilations by the bureau of mines, department of interior. Consumption of pig iron amounted to 18,504,349 tons, 46 per cent less than 34,056,527 tons in 1937. Scrap charged to steel furnaces declined 45 per cent, and to iron furnaces 41 per cent.

Increased use of purchased scrap in iron furnaces caused a decrease in proportion of pig iron used, from 35.1 per cent in 1937 to 33.1 in 1938. In steel furnaces net result of increased scrap use was a slight decrease in use of pig iron, from 50.4 per cent in 1937 to 50.1 per cent in 1938.

Open-hearth furnaces in 1938 consumed 14,607,630 tons of scrap, 68 per cent of the total; in 1937 open hearth consumption was 26,414,037 tons, 69 per cent. Pennsylvania was the largest scrap consumer, 4,736,524 tons; Ohio second, 4,161,317 tons; Indiana third, 2,387,284 tons; Illinois fourth, 1,879,204 tons.

Exports of scrap in 1938 totaled 2,998,607 tons, 14 per cent as much as domestic consumption; in 1937 4,101,549 tons, 11 per cent. Japan took 46 per cent of the total, Italy 14 per cent and the United Kingdom 13 per cent, in 1938.

SCRAP CONSUMPTION 71 PER CENT OVER LAST YEAR

Domestic scrap consumption continues heavier than last year and scrap exports are running behind 1938, the Institute of Scrap Iron and Steel Inc. reports. Consumption in four months this year totaled 9,474,117 gross tons, an increase of 71.2 per cent over the 5,538,212 tons melted in the comparable period of 1938. Exports at 1,115,183 tons in first four months were 20.3 per cent less than 1,261,927 tons shipped abroad in comparable 1938 period.

Germany Broadens Use Of Aluminum Alloys

■ Light metals, such as aluminum and aluminum alloys, are being used increasingly in the German four-year plan, replacing steel, nonferrous metals and other structural materials, according to reports to the department of commerce from its Berlin office.

Principal aluminum alloys are said to be aluminum-magnesium, aluminum-magnesium-silicon, aluminum-copper-magnesium.

MEN OF INDUSTRY

■ M. A. WILLIAMS has been appointed district sales manager in the Indianapolis territory for Republic Steel Corp. He has been in charge of Union Drawn Steel division sales in that territory and the two positions will be combined. Mr. Williams entered the steel industry in 1911 with Cambria Steel Co., Johnstown, Pa. Eight years later he became associated with La Salle Steel Co., in Chicago, which was followed by an association with Bliss & Laughlin Inc., in Harvey, Ill. He was made district sales manager at Indianapolis for Union Drawn Steel Co. in 1927. S. G. Disque continues as assistant district sales manager.

♦

E. D. Hollinshead, formerly assistant to manager, public relations department, Chicago district, Carnegie-Illinois Steel Corp., has been named manager of real estate.

♦

Roger C. Jones has been appointed representative in the lower New England territory by Philadelphia Gear Works. His headquarters will be in Hartford, Conn.

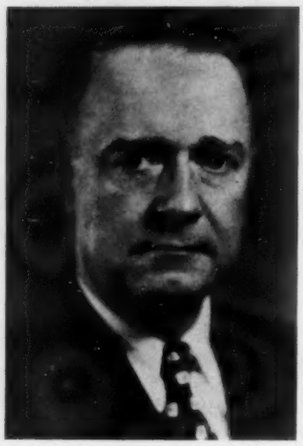
♦

C. E. Barner has joined Wright Mfg. division of American Chain & Cable Co. Inc., Bridgeport, Conn., as district sales manager, with headquarters in Cleveland. He has had wide experience in the material handling field.

♦

Samuel L. Hoyt, since 1931 engaged in research with A. O. Smith Corp., Milwaukee, has become associated with Battelle Memorial institute, Columbus, O., as metallurgical research advisor. He is well known for his work in developing cemented tungsten carbides for cutting tools and on temperature-resistant alloys. He has been a director and active committee worker in the American Society for Metals, is a member of several committees of American Institute of Mining and Metallurgical Engineers, and a member, Institute of Metals.

Samuel L. Hoyt



M. A. Williams

♦

Luke E. Sawyer, formerly assistant general superintendent, Babcock & Wilcox Tube Co., Beaver Falls, Pa., has been promoted to general superintendent.

♦

T. G. Roberts, Harrison building, Philadelphia, has been appointed agent for SAE Steels Inc., Cleveland, in Philadelphia district and territory extending to the south. Mr. Roberts also represents the Fitzsimons Co., Youngstown, O., and the E. W. Ferry Screw Products Co., Cleveland.

♦

Parker F. Wilson, formerly with Wheeling Steel Corp., Wheeling, W. Va., and at one time vice president and general manager, Otis Steel Co., Cleveland, has been elected president. Pittsburgh Steel Foundry Corp., Glassport, Pa., succeeding G. A. Hassel, who becomes chairman of the board.

♦

J. E. MacCloskey Jr., vice chairman, Harbison-Walker Refractories Co., Pittsburgh, has been elected chairman of the board, to succeed the late J. E. Lewis. H. B. Campbell has been made a director, to fill the vacancy caused by death of Mr. Lewis, and also has been elected a vice president. Mr. Campbell will be in charge of operations.

♦

Norman A. Lincoln has been appointed works manager of Evans Products Co., Detroit. Mr. Lincoln has been associated with production and purchasing in the automotive industry over 20 years, having been active with Hupp Motor Car Corp. 19 years, finally becoming director of purchases; later joining the Crosley Radio Corp., Cincinnati, to assist on production and assembly plans for the new Crosley car. In his new capacity Mr. Lincoln will have charge of all manufacturing and allied departments.

♦

J. H. Morrison has been named superintendent of hot rolling operations of Pittsburgh Steel Co.'s Monessen and Allenport, Pa., plants. Prior to joining Pittsburgh Steel in 1936 he was with Sharon Steel Corp., and previous to his present appointment was superintendent of hot rolling works in Monessen.

♦

E. T. Eggers, who joined the American Steel & Wire Co., Cleveland, in 1934 as a salesman in the Philadelphia office and subsequently was transferred to Dallas and then to Houston, Tex., has been named by the company as special representative on wire rope for the Gulf Coast oil fields. His headquarters will be in the Praetorian building, Dallas.

♦

A. D. Masters, assistant manager, Terre Haute, Ind., branch of Crane Co., Chicago, has been named manager, succeeding W. E. Miller, who has been granted an indefinite leave of absence due to ill health. J. L. Foster has been made assistant manager.

M. W. Link, consulting engineer in the company's research and engineering division, has been made manager of marine sales. He succeeds the late E. L. Brugman.

♦

John Edward Jackson has been elected president, Pittsburgh-Des Moines Co., Pittsburgh. He succeeds his father, the late W. H. Jackson. Since graduation from Iowa State college, Mr. Jackson has been associated actively with various departments of the company and its affiliate, Pittsburgh-Des Moines Steel Co. He was manager of the incinerator department a number of years and

John E. Jackson

since 1935 has been general manager, construction department.

William R. Jackson has been elected a director, Pittsburgh-Des Moines Co. and also assistant secretary and treasurer. List of other officers is unchanged.

♦

Joseph A. DeLo has been named sales promotion and advertising manager, Continental Steel Corp., Kokomo, Ind. Associated with the corporation since 1932, he formerly was assistant advertising manager. Previous to that Mr. DeLo was engaged in newspaper work in Kokomo and elsewhere in the Middle West as editor and advertising manager.

♦

D. J. Erikson has been appointed vice president in charge of sales, Hagan Corp., Pittsburgh, and its subsidiary companies, Hall Laboratories Inc., Buromin Co. and Calgon Inc. For more than 20 years Mr.

D. J. Erikson

Erikson has been active in promoting the growth of the corporation's various enterprises. He has served as assistant to president, sales manager of Calgon Inc., and formerly was sales manager, devoting his efforts to the sale of Hagan automatic combustion control.

♦

Lloyd R. Vivian, advertising manager, Ditzler Color Co., has been elected president, Industrial Marketers of Detroit, chapter of the National Industrial Advertisers' association. Other officers are: Vice president, Thomas B. Moule, advertising manager, Ex-Cell-O Corp.; secretary, Lyle D. Worden, Morse Chain Co.; treasurer, John Ashburne Jr., commercial division, Nash-Kelvinator Corp.

♦

E. Kent Hubbard, president, Manufacturers Association of Connecticut, was re-elected chairman of the board, National Industrial Conference board, New York, at its twenty-third annual meeting recently in New York. Irenee du Pont, vice chairman, E. I. du Pont

Joseph A. DeLo

de Nemours & Co., was re-elected vice chairman, as was Walter J. Kohler, chairman, Kohler Co. Newly elected vice chairmen are Neal Dow Becker, president, Intertype Corp., and David M. Goodrich, chairman, B. F. Goodrich Co. Dr. Virgil Jordan, who has served the board 18 years, will continue as president.

♦

Frank B. Williams Jr. has resigned as vice president in charge of the merchandising division, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., effective July 1. Before taking charge of the Westinghouse merchandising division, Mr. Williams had been vice president, Diehl Mfg. Co., Elizabethport, N. J. Frank R. Kohnstamm, sales manager of the merchandising division, from July 1 will report to Ralph Kelly, vice president in charge of sales. L. E. Osborne, manager of manufacturing and engineering, merchandising division, from July 1 will report to George H. Bucher, president.

♦

N. N. Shepherd, formerly with Carboloy Co., has joined Firth-Sterling Steel Co., McKeesport, Pa., as a Firthite engineer with headquarters in Chicago. Other additions to the company's sales-engineering staff are: Clifford W. Nitchie, formerly with Vascoloy - Ramet Corp., as a Firthaloy die engineer, also in Chicago; Leslie T. McKinnon, heretofore with Braeburn Steel Corp., as a steel sales representative in Detroit; George L. Sharpe, previously with Tungsten Carbide Tool Co. and Michigan Tool Co., as Firthite sales representative in Detroit; A. W. McCoy, formerly with Carboloy Co. and Union Wire Die Co., as a Firthaloy engineer in New York, replacing J. W. Mordica, who has been transferred to McKeesport; and F. H. Becker, who has been transferred from Detroit to Syracuse, N. Y., where he will be a Firthite engineer.

Lloyd R. Vivian

DIED:

■ J. ALBERT MATTSON, 65, sales representative for Firth-Sterling Steel Co., McKeesport, Pa., in the New England district, at his home in Chicago, recently. He had been with the company 31 years, in Chicago, Cincinnati and Boston.

♦

Frederick P. Tessmer, treasurer, Tessmer Machine & Tool Co., Detroit, recently in Detroit.

♦

David S. Spacke, 54, one of the founders, Spacke Machine Co., Indianapolis, maker of machine tools, recently in that city.

♦

L. S. Maremont, 63, one of the original founders of Maremont Automotive Products Inc., Chicago, in that city, June 8.

♦

David E. Knall, 47, vice president, Calumet Foundry & Machine Co., East Chicago, Ind., in Chicago, June 11.

♦

John M. Westerlin, 84, president, Westerlin-Campbell Co., refrigerating machinery manufacturer, Chicago, June 10 in that city.

♦

Rankin H. Roberts, 58, director and supervisor of buying, Hibbard, Spencer, Bartlett & Co., Chicago, June 11 in Chicago.

♦

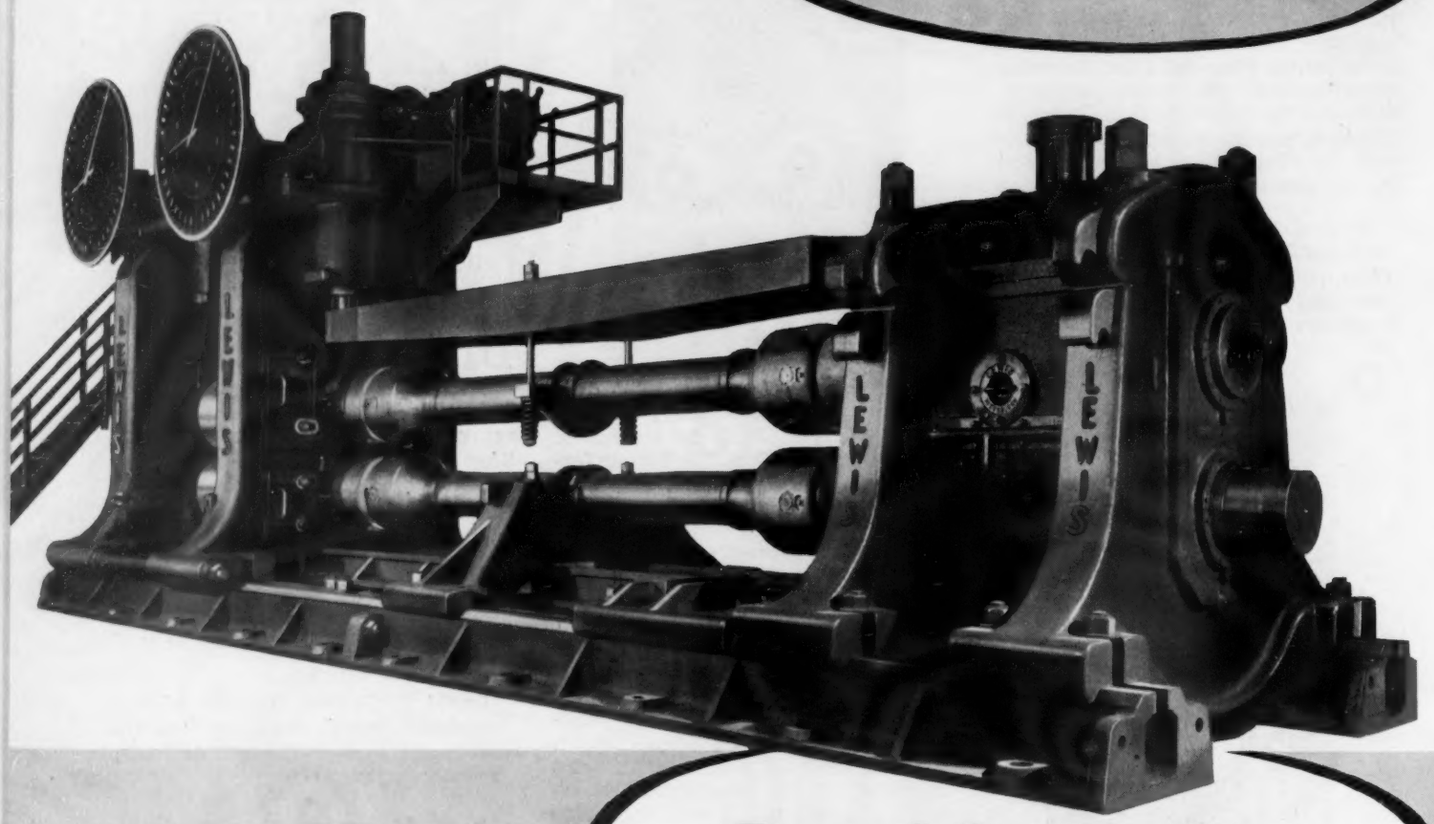
Frank N. Mead, 66, recently in Milwaukee, where he had been sales representative for the Firth-Sterling Steel Co., McKeesport, Pa., 38 years.

♦

James W. Thornton, 58, former Republic Steel Corp. executive, and superintendent of the Lake Erie Steel Co., Cleveland, May 26. After leaving Lake Erie Steel he worked for National Carbon Co. and Union Carbide & Carbon Co.

LEWIS BLOOMING MILLS

2 High Reversing
3 High Blooming Mills



Rugged Construction

Accurate Screwdown

Rapid Roll Change

Lifetime of Economical Production

LEWIS FOUNDRY & MACHINE
DIVISION OF BLAW-KNOX CO.
PITTSBURGH, PA.

Windows of WASHINGTON

By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ HOUSE ways and means committee has reported out a new revenue bill embodying broad tax revisions. The proposed changes:

Allow the undistributed profits tax to expire Dec. 31, with this new bill effective Jan. 1.

Impose income tax of 18 per cent on corporations earning over $25,000 annually. Present rates on earnings of $25,000 a year or less would be retained. These are: First $5000, 12½ per cent; $5000 to $20,000, 14 per cent; $20,000 to $25,000, 16 per cent.

Allow corporations to carry over net operating business losses for two years. Losses incurred during the year 1939 would be carried over against 1940 profits, and any excess could be applied against 1941.

Allow corporations to increase capital stock value in each of next two years, but not decrease it. This would permit capital stock value declarations to minimize excess profits tax. Under present law, corporations can revalue capital stock either up or down in 1941.

Repeals Deduction Limit

Repeal present limit of $2000 deduction for capital losses from corporation's ordinary income. Long-term capital losses—those on capital held over 18 months—to be applied in full against ordinary income of corporation for tax year in which loss was realized.

Corporations to be given the same treatment as individuals in regard to short-term capital losses.

Banks, insurance companies, and corporations in territorial possessions to be taxed under the general provisions. Their present rate is 16½ per cent as these groups are exempt from undistributed profits tax.

Mutual investment companies, now receiving this same special treatment, to pay 18 per cent tax on all earnings.

Foreign corporations engaged in trade or business in the United States to be taxed 18 per cent, a reduction of 1 per cent.

Corporations in bankruptcy or receivership, joint stock land banks and rental housing corporations, to be treated as all other corporations. They now have a 2½ per cent credit, nullifying the undistributed profits tax.

Under the bill reported out the present excise tax on copper is to be continued until June 30, 1941.

RECOMMEND $14,250,000 FOR 1940 EDUCATIONAL ORDERS

House committee on appropriations last week reported a supplemental military appropriation bill for the new fiscal year beginning July 1.

Included is provision of $14,250,000 for "educational orders." It was originally contemplated that $32,500,000 would be appropriated for such orders, but the committee prefers to expend the full amount in two years rather than one.

In its report committee observed regarding educational orders:

"For placing educational orders to familiarize private manufacturing establishments with the production of munitions of war of special or technical design, noncommercial in character, the committee recommends an additional appropriation of $14,250,000 for the fiscal year 1940.

"The act approved April 3 authorizes the appropriation of $42,500,000 for such purpose and expressly provides this sum be spread over fiscal years 1939, 1940 and 1941, with $2,000,000 during each of the next succeeding four fiscal years. A previous measure authorized appropriation of $2,000,000 for educational orders during each of the five years beginning with the fiscal year 1938.

Thus $4,000,000 is already available against the funds the new law contemplates for the fiscal years 1939, 1940 and 1941. Of the remaining amount the committee recommends appropriation of $14,250,000 for the fiscal year 1940, which, in conjunction with the $2,000,000 previously provided, would make available $16,250,000.

"In connection with this plan, sight should not be lost of the unusually large procurement program provided for at the present session, encompassing antiaircraft artillery, semiautomatic rifles, antitank guns, tanks, light and heavy artillery, and ammunition. In addition to about $37,000,000 carried in the 1940 military appropriation act, $110,000,000 in appropriations and contractual authority was made available for such items in the second deficiency appropriation for fiscal year 1939.

"This alone constitutes a tremendous educational program. Approximately 75 per cent of the $110,000,000 is to be spent upon *materiel* procured from industry. That does not mean articles completely manufactured. It means, largely, parts to be used in the fabrication of finished articles in the arsenals.

Would Revise Procurement

"If the educational order program is to be continued, committee suggests it may be well to amend the existing law with regard to arsenal production or manufacture, from the standpoint of following up the educational orders with regular production orders. Under present law a 'repeat' educational order may not be placed 'within any period of three successive years,' and under this procedure a follow-up production order is a remote possibility."

In connection with the proposed appropriation for educational orders, Assistant Secretary of the Treasury Louis Johnson, in charge of their allotment, has asked ten leading industrialists to serve as a special advisory committee for handling the orders. Included are: J. L. Perry, president, Carnegie-Illinois Steel Corp.; Frank D. Bell, president,

Edgewater Steel Co.; William Knudsen, president, General Motors Corp.; Charles J. Stilwell, president, Warner & Swasey Co.; Donald W. Douglas, president, Douglas Aircraft Co. Inc.; and William H. Coleman, president, Bucyrus-Erie Co.

NAM PATENT GROUP VISITS COMMERCE DEPARTMENT

Study of the patent system to determine if there is need for effecting changes to aid industry will be undertaken by a subcommittee on patent procedure of the National Association of Manufacturers.

Personnel of the group has been selected by the association from various manufacturing fields in all sections of the country.

Members of the subcommittee visited the department of commerce last week, discussing their proposed study with Conway P. Coe, commissioner of patents, and other patent officials.

Subjects discussed included the simplification of language of the patent document, especially to make the claims indicate more clearly the scope of the protection; the effect of revisions of the patent system now advocated by the department of commerce; the delays attending procurement of patents, and the procedure for determining priority where an invention is claimed by two or more persons.

The work of the patent office's various units was inspected in an endeavor to become acquainted more completely with the procedures normally employed.

Members who visited the department included: Henry Lanahan, vice chairman of the subcommittee, Thomas A. Edison Inc., West Orange, N. J.; H. G. Donham, vice president, United Shoe Machinery Corp., Boston; H. R. Doty, Hugh H. Eby Inc., Philadelphia; George E. Folk, special patent advisor, committee on patents and trade marks of the National Association of Manufacturers; J. A. Holton, Underwood Elliott Fisher Mfg. Co., New York; R. T. Moore, Consolidated Packaging Machinery Corp., Buffalo; Joseph Rossman, patent attorney, Marathon Paper Mills Co., Rothschild, Wis.; E. A. Terrell, president, Terrell Machine Co., Charlotte, N. C.; R. J. Wean, president, The Wean Engineering Co., Warren, O., and R. J. Dearborn, patent counsel, Texas Co., New York.

HOUSE COMMITTEE REPORTS NEUTRALITY RESOLUTION

House foreign affairs committee last week favorably reported a neutrality resolution sponsored by the administration.

It contains provisions of the act of May 1, 1937, respecting loans and credits to nations at war; the solicitation and collection of funds for nations at war; the use of American ports as a base of supply; the regulation of the use of our ports by foreign submarines and armed merchant vessels; and the prohibition of the arming of American vessels engaged in commerce with nations at war. It also provides for the continuation of the national munitions control board and the system of arms export and import licenses. The resolution does not provide an embargo on any class of goods; it does stipulate the export of all classes of goods destined for nations at war be preceded by the transfer of title to the foreign purchaser.

APPROVE FUNDS FOR HOPKIN'S NEW BUSINESS ADVISERS

Senate last week passed commerce department's appropriation bill for the fiscal year 1940. Included is an appropriation of $255,000 requested by Secretary Hopkins for salaries and expenses for additional business advisers.

This item was not included in the bill as it passed the house, but its appropriation was subsequently recommended by President Roosevelt.

The senate tied Hopkins up in a manner not to his liking. As the bill passed the senate, the $255,000 appropriation carries a specification that any person employed at a salary of $5000 or over under this appropriation must be appointed by the President and ratified by the senate. This is not at all what Hopkins wanted, and an effort is being made in conference to have the provision stricken from the bill.

Hopkins appeared before the senate appropriations committee to ask for this appropriation, explaining he needed more expert advice. "Thorough study," said Hopkins, "has convinced me of the need for an executive staff to implement the work of the department if we are to meet the demands being made on us by business and industry and fulfill the expectations of the President and the nation.

"When the President asked me to take the post of secretary of commerce he pointed out that the course of events since 1933, and the great number of new statutes affecting business, had created a need for a completely new function for the department. That need, as he saw it, was to make sure that the objectives of the administration's program for reforms in our business structure were carried out with the utmost technical skill so that we should have no more disturbance of business than was absolutely necessary to attain these accepted objectives.

"This purpose calls for a new kind of ability and a new kind of energy in the department of commerce quite different from that which has been required to carry out the normal administrative functions of the old department. It is a function which I feel sure will meet the approval of every member of congress who is convinced, as I am, that helping business will help the country."

EQUIPMENT LOANS TO RAILS STUDIED BY ADMINISTRATION

Loans to the railroads for new equipment are now being studied by the government, it was disclosed by President Roosevelt at his press conference Friday.

Two plans are under consideration, one being direct loans to the roads, the other the building and leasing of equipment with the government holding title. The latter, Mr. Roosevelt stated, would involve the creation of a new government agency.

TO SAVE $1,710,000,000 BY SECURITY ACT CHANGE

By an overwhelming vote the house has approved social security act amendments which it is contended will save employers $1,710,000,000. Old age pension tax is to be frozen at its present rate instead of being increased on Jan. 1, 1940, as originally provided. The senate's finance committee last week held hearings on the bill, and it is a foregone conclusion that the revision will be affirmed.

As it passed the house, the bill moves the effective date of old age pensions up to Jan. 1, 1940. The tax relief provided is due to failure to stepup the old age insurance rate for another three years, and by permitting states with adequate reserves to scale down unemployment insurance taxes exacted from employers.

The bill abandons the original plan to build up a $47,000,000,000 reserve fund and substitutes a contingent reserve system that would not climb above $7,752,000,000 in the next 15 years.

GOVERNMENT IRON, STEEL AWARDS TOTAL $363,796

During the week ended June 3 the government purchased iron and steel products costing $363,795.62 under the Walsh-Healey act as follows: Messinger Bearings Inc., Philadelphia, $58,828; Warren Foundry & Pipe Corp., New York, $23,362.56; J. B. Slattery & Bros. Inc., Brooklyn, N. Y., $67,791; Welbilt Appliance Corp., Maspeth, L. I., $56,713.25; American Bridge Co., Denver, $70,245; Bethlehem Steel Export Corp., New York, $24,656.41; and Stupp Bros. Bridge & Iron Co., St. Louis, $62,019.40.

AVIATION

ARMY TO GET $187,000,000 FOR ADDITIONAL PLANES

■ MILITARY aircraft costing $187,000,000 are to be purchased by war department under the deficiency bill now before the house.

Involving about 2290 new planes, the measure would bring the army air corps fighting strength to 5500 serviceable units by July 1, 1941. Also provided is a $5,000,000 supplemental appropriation for aeronautical research in 1940.

Substantial contracts for airplanes and parts were allotted by the government last week. To Seversky Aircraft Corp., Farmingdale, L. I., went an army order for 13 all-metal monoplanes costing $974,324.

Waco Aircraft Corp., Troy, O., booked an order from the army for two-place training craft amounting to $93,544. This company also signed a $100,000 contract to build seven cabin planes for civil aeronautics authority. Others receiving training ship orders were St. Louis Aircraft Corp., St. Louis, and Ryan Aeronautical Co., San Diego.

Awards for engines and accessories: Curtiss-Wright Corp., New York, miscellaneous parts, $1,117,811; Eclipse Aviation division of Bendix Aviation Corp., Bendix, N. J., starters and switches, $441,056; Pratt & Whitney division of United Aircraft Corp., East Hartford, Conn., engines, $164,062, and parts, $28,056; Pump Engineering Service Corp., Cleveland, pump assemblies, $69,093; Pioneer Instrument Co. Inc., Bendix, N. J., oxygen regulators, $52,325; and Leece-Neville Co., Cleveland, generators, $34,440.

Beech Aircraft Corp., Wichita, Kans., has registered with SEC its intention to issue 100,000 additional shares of common stock, part of the proceeds going into machinery and other production equipment.

Contracts have been placed by Wright Aeronautical Corp., Paterson, N. J., for building a one-story addition to its assembly plant, and a 78-foot steel bridge between two factory units. Architect is Albert Kahn Inc., Detroit.

Aluminum Co. of Canada Ltd., Montreal, is ready to start constructing at Kingston, Ont., a plant to produce aluminum sheets for airplanes. Total cost with equipment is estimated at $500,000.

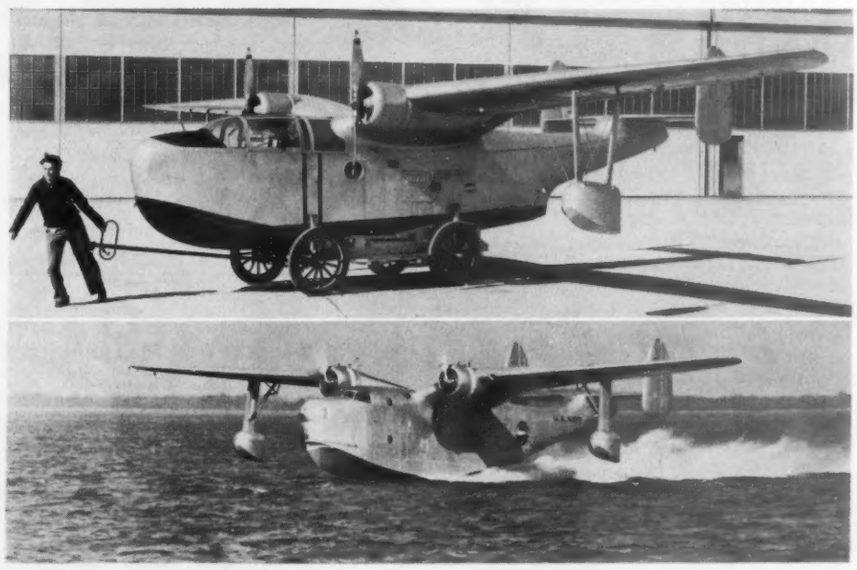
New Aircraft Builders

Capitalized at $1,000,000, General Aircraft Corp. has just been organized in Los Angeles and proposes manufacturing operations. Ralph A. Beal, Los Angeles, is a director. Also newly-formed is North Pacific Aircraft Corp., Seattle, planning to produce a new type twin-engined lightplane. Company's representative is George Yates, Seattle.

A broad program for training factory apprentices was launched last week by Lockheed Aircraft. Apprentices 18 to 23 years of age will work and study during a 4-year period in the firm's Burbank, Calif., plant. Compensation will approximate one-half the prevailing scale for journeymen.

American Magnesium Corp., Cleveland, has completed a new sand foundry in Los Angeles, will supply magnesium alloys to western airplane builders. It is said the aircraft industry today consumes 60 per cent of all fabricated magnesium alloys.

Flying Model Shows Bomber's Performance



■ How Glenn L. Martin Co.'s new navy patrol bomber would perform was demonstrated before its construction by an exact quarter-scale, man-carrying flying model, the first of its kind ever built. Gull-winged, the big ship is all-metal, weighs 18 tons, carries crew of seven

140 Attend Baltimore Steel Club Outing

■ Steel Club of Baltimore's fourth annual golfing party June 9 at the Rolling Road golf club was attended by 140 members and guests, many of the latter from distant cities.

C. H. Michel, Maryland Metal Building Co., and club president, presented to Past President Charles S. Duvall, Maryland Bolt & Nut Co., a plaque in recognition of his services to the club.

Harry A. Robowtham, Belmont Iron Works, Philadelphia, had low gross in the golf tournament. George H. French, Maryland Dry Dock Co., had low net. Following Mr. French were J. A. Doyle Jr., Jones & Laughlin Steel Corp.; Henry Heine, Hudson Supply & Equipment Co., Washington; Charles A. Lynn, E. I. du Pont de Nemours, Philadelphia; and Dan Brierly, American Bureau of Shipping. Robert Price, Southern Supply Co., won a special golf trophy.

Arrangements committee: Charles W. Test, Youngstown Sheet & Tube Co., chairman; Frank Carter, Maryland Dry Dock Co.; W. D. Bourquin, Republic Steel Corp.; J. B. Coster, Bethlehem Steel Co.; H. R. Dorney, Jones & Laughlin Steel Corp.; and G. H. Mackelcan, American Steel & Wire Co.

Pangborns Give Public Park to Hagerstown

■ Pangborn public park, presented to Hagerstown, Md., by Thomas W. Pangborn, president, and John C. Pangborn, vice president, Pangborn Corp., manufacturer of foundry equipment, was dedicated June 10. State and city officials participated in the exercises.

The park, consisting of 7½ acres, given by the Pangborn brothers, has been landscaped and equipped by the city. In addition to gardens, a lake and other ornaments, baseball diamonds, tennis courts and playgrounds have been provided. Tables and stoves in a grove serve picnickers.

IT STARTED IN THE AIRCRAFT INDUSTRY WITH CYLINDER STUDS!

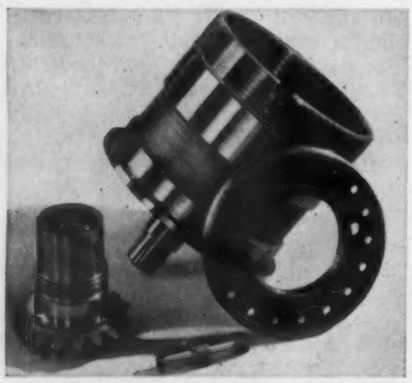
Now grinding is top ranking production method for generating threaded parts

HOW can we put better, stronger threads on our highly stressed cylinder studs? That was the cry of the aircraft industry only a few years ago. They had already reached the absolute limit of accuracy and dependability in generating threaded sections by the old methods.

The answer was thread grinding! With the introduction of accurate and efficient machines in 1935, it became possible for the first time to generate cylinder stud screw threads from the blank by grinding . . . on a production basis. Previous to this, thread grinding had been an obscure process used only for the correction of screw threads.

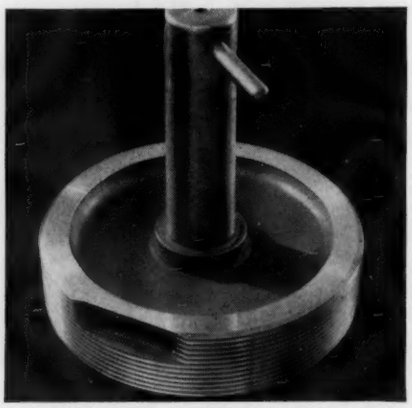
Thread grinding provides the accurate size and perfect finish necessary for the high factor of safety required in aircraft engine parts such as these rocker arm bolts.

The result of grinding the cylinder stud threads was a vast improvement in accuracy and dependability . . . at a surprisingly low cost. The new method was so sensationally successful that its use was soon extended by aircraft manufacturers to practically all threads on external surfaces, and to internal surfaces where size would permit.



Clutch barrels and related parts are ground to meet requirements for extreme accuracy.

Manufacturers in other fields were not slow to fall in line. They have eagerly adopted thread grinding and made it one of the top ranking production methods for generating threads of all kinds . . . in a wide variety of materials . . . for almost every conceivable purpose.



Grinding was used to make this tapered plug gauge for internal pipe threads.

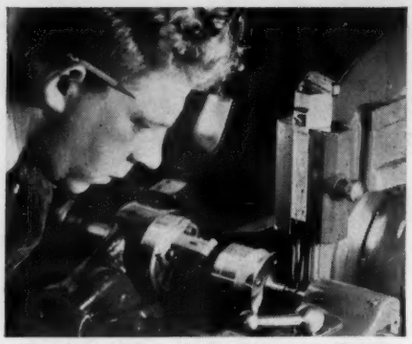
Thread grinding has many advantages

No wonder thread grinding was enthusiastically received. It gives a highly accurate thread section, with a smoother, better finish and appearance. The thread is stronger and more dependable. There is almost a complete absence of checks and cracks. And because the grinding is done after heat treating, the threads are unusually hard and wear resistant.

These advantages are gained with no sacrifice in economy. Production is rapid and the cost low. For a given degree of accuracy, many thread pitches may be produced from the blank in a fraction of the time required to mill or turn the same threads. No special skill or experience is required by the operator.

Any material can be threaded by grinding

Any material, metallic or non-metallic, which can be ground can also be threaded by means of special thread grinding wheels and thread grinding machines. The advantages of the process are particularly outstanding on the threading of corrosion, heat and abrasion resisting alloy steels;



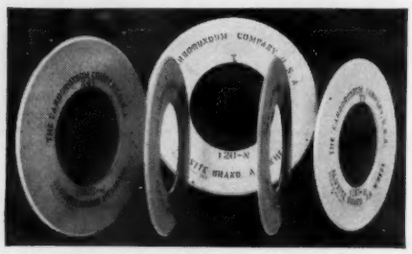
Thread grinding is simple. Accurate results are secured without experienced operators.

and on those materials with abrasive qualities like hard rubber, hard fibre, hard baked carbon, and moulding compounds (especially those containing fillers like mica dust).

Correct grinding wheels necessary for best results

As in all precision grinding, the use of the right wheel is of paramount importance in thread grinding. Even before the appearance on the market of thread grinding machines for production work, Carborundum had discovered and introduced the modern types of specially bonded thread grinding wheels. This availability of suitable wheels had a great deal to do with the immediate success of thread grinding on a production basis.

Adequate stocks of uniform, high-quality Carborundum-made thread grinding wheels are carried at all times, to meet every thread grinding requirement from 2 to 80 threads per inch. And Carborundum's wide



Strong, accurate threads are ground with Aloxite Brand Resinoid and "AA" Aloxite Brand Vitrified Wheels manufactured by The Carborundum Company.

experience in thread grinding is available at once to any manufacturer who is interested in a further investigation of the advantages of this revolutionary process. Inquiries will be welcomed at any office of The Carborundum Company.

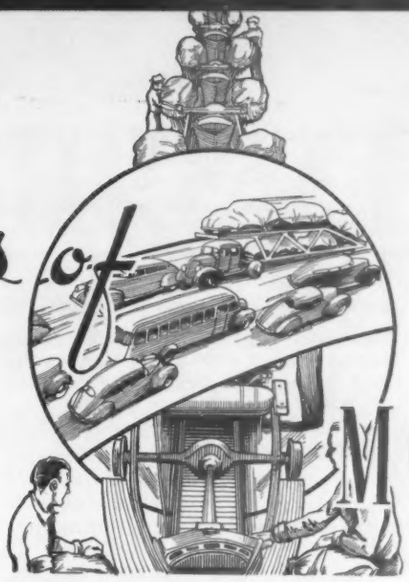
CARBORUNDUM
REG. U.S. PAT. OFF.
ABRASIVE PRODUCTS

THE CARBORUNDUM COMPANY
REG. U.S. PAT. OFF.
Niagara Falls, N. Y.

Sales Offices and Warehouses in New York, Chicago, Philadelphia, Detroit, Cleveland, Boston, Pittsburgh, Cincinnati, Grand Rapids

Carborundum and Aloxite are registered trade-marks of The Carborundum Company

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

Material appearing in this department is fully protected by copyright, and its use in any form whatsoever without permission is prohibited.

DETROIT

■ SHARP impetus to activity on new models was reported in this city last week by vendors of a wide range of materials and parts, some of whom received the largest amounts of prospective new business in several years. Much of this, of course, is only in the inquiry or price-figuring stage, but indications are that a considerable volume of specifications have been released by engineering departments, and orders should be out soon.

The three-week delay in Briggs operations as a result of a strike naturally held up release of specifications on new model parts from this source, and resumption of activity on the 1940 Chrysler body lines has been one factor in improving the outlook for suppliers.

Fisher Body plants are practically at peak capacity on work for the new General Motors lines, and some jobs are being transferred to outside shops to relieve the pressure.

The dark cloud of labor unrest, however, glooms the picture and at any moment might break out into more showers. Latest move of the CIO union is to issue demands for a supplemental contract for 1800 toolmakers and skilled workers in General Motors plants now busy on 1940 programs. The corporation has taken the position it cannot justifiably enter into negotiations with any union group until the courts or the NLRB determine whether the CIO or AFL unions are legal agents to represent workmen.

Defiantly, Walter P. Reuther, director of the General Motors union members allied with the CIO, has stated: "If William Knudsen insists that only the courts can decide who shall speak for the GM workers, we will be compelled to tell him to see if the courts can make his tools and dies."

The union has compiled a long list of demands for tool and die workers, including a clause permitting the placing of a union label on tools and dies and pledging the company to use only tools bearing this label.

This recalls demands made at the time of the 1937 strikes here when the UAW proposed union labels for nearly everything going into an automobile, including steel. Under such an arrangement a union workman would have refused to handle any part or any material which did not carry such a label, thereby forcing the unionization of all the companies supplying the auto industry. Naturally the demand was never given a moment's consideration.

Effort of Homer Martin to close the Fisher and Chevrolet plants in Flint last week flopped miserably. Figures tell the story. At Fisher No. 1 plant, out of a total force of 2990, company records show 724 absent Monday, 360 on Tuesday and only 174 Wednesday. At the Chevrolet plants, out of a total force of

From Toledo to Europe—by Water

■ **Norwegian steamship BENCAS is being loaded with Willys-Overland cars at a dock in Toledo, O., for shipment to various points in Sweden. Ocean-going vessels make their way to Great Lakes ports by way of the St. Lawrence and the Welland canal. Direct shipment to foreign markets permits Willys to lower price tags on merchandise at these points, according to R. J. Archer, manager of Willys Export Corp.**

6900, only 430 were out on Monday, 368 on Tuesday and 170 on Wednesday. At the Chevrolet foundry in Saginaw, employing 2700, absentees Monday numbered 600, and by Wednesday practically the entire force was at work.

Sensing the unwillingness of his followers to join picket lines, Martin then tried to enlist the aid of the AFL teamsters' union by asking them to refuse to haul materials into the plants. At first, this was agreed upon, but Tuesday the order was countermanded by AFL headquarters. Martin's followers then turned to staging regular attacks on CIO workmen outside the plants and also on CIO headquarters in Flint.

Union members, on Martin's recommendation, voted Wednesday night to call off the strike. This followed a promise the strikers would not be discriminated against.

Releases of 1940 model steel tonnages have not been made in any volume, although Buick has released one lot for 10,000 cars. All large consumers in this territory are covered at the lower prices prevailing a few weeks ago, and it is believed that even Ford, who professed at the time to have booked only a small fill-in tonnage "at a price," has tacitly covered steel requirements over the balance of the year.

■ REPORT of federal trade commission on the automotive industry shows some interesting figures on profit performance in the years 1929-37. General Motors divisions made average net profit of 24.85 per cent on dollar sales of parts and accessories, 7.18 per cent on new car sales; Chrysler showed 17.3 per cent profit on accessories, 6.6 per cent on new cars; and Ford made 12.07 per cent on accessories, lost 0.36 per cent on new car sales.

The commission did not explain how the Ford percentages were determined and since the company issues no financial statement comparable with other companies the figures may be questionable. If accurate, however, they show that for every $100 worth of new cars sold, Ford has turned back $100.36 into plant, equipment and returns to the owners. The latter is the unknown figure, but with only three owners it is safe to say the bulk of the income was reinvested in plants.

Investments in new plants in general throughout the automotive and allied industries do not show any pronounced improvement. Chrysler has announced approval of appropriation for doubling the size of its present engineering laboratories, but no start has been made on the project. Electric Auto-Lite Co. at Toledo, O., soon will begin construction of a new plant, location and purpose not yet known. Cleveland Graphite Bronze Co., supplier of large quantities of automotive bearings, also will undertake construction of a new plant in the near future.

■ OF CONSIDERABLE interest to the metals industries is an experimental project now under way at the Ford plant, involving the production of ball bearing assemblies of cast steel. Both the balls themselves and inner and outer races are cast of a steel corresponding to the Ford BB analysis, and the assembly is complete with a couple of stampings for certain retainers.

Ford engineers minimize the importance of this development, stating that balls for bearings have been cast for ten years, and that the casting of bearing races was a natural outgrowth of the work done on centrifugal casting of gears, now a production operation. No equipment has been purchased for casting these bearing assemblies, those machines which have been built coming from equipment already available. As yet no plans have been divulged for putting such bearings on a production basis, but in the light of success already achieved with centrifugal casting it would appear that they have possibilities for the future.

Another development in the castings field is reported to be launched at Kelsey-Hayes Wheel Co. here. Equipment has been designed and is now in process of building for the manufacture of composite steel and iron brake drums by a centrifugal process. Two rocking-type electric furnaces have been ordered for duplexing cupola iron which will then be fed into spinners and spun on the inner side of pressed steel backings. This project still is in the preliminary stage although a reported expenditure of $250,000 for equipment will be made.

Similar types of drums are produced by the Centrifugal Fusing Co. in Lansing, Mich., and are used by a number of makes of automobiles currently. The fact that Kelsey is initiating production of such a drum lends credence to the report more of the large-scale producers may switch to the composite centrifugally cast drum for 1940 models.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1937	1938	1939
Jan.	399,186	227,130	353,946
Feb.	383,900	202,589	312,141
March	519,022	238,598	389,489
April	553,231	238,133	354,263
May	540,377	210,183	*306,000
5 mos.	2,395,716	1,116,658	*1,715,839
June	521,153	189,399	.....
July	456,909	150,444	.....
Aug.	405,072	96,936	.....
Sept.	175,630	89,623	.....
Oct.	337,979	215,296	.....
Nov.	376,629	390,350	.....
Dec.	347,349	407,016	.....
Year	5,016,437	2,655,777	.....

*Estimated.

Estimated by *Ward's Reports*

Week ended:	1939	1938†
May 20	80,145	46,810
May 27	67,740	45,120
June 3	32,445	26,980
June 10	‡65,265	40,175
June 17	78,305	41,790

†Comparable week.

	Week Ended June 17	Week Ended June 10
General Motors	31,910	30,650
Chrysler	22,900	‡8,145
Ford	15,500	‡17,600
All others	7,995	8,820

‡Revised.

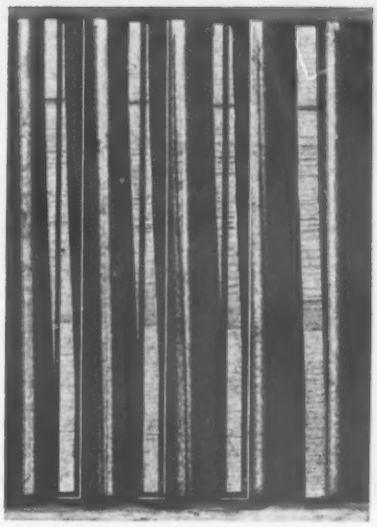
Metallurgy, Economics On Founders' Program

■ Malleable Founders' society, Cleveland, will hold its annual meeting June 23-24 at Westchester Country club, Rye, N. Y. A technical session will be held each morning, with afternoons and evenings devoted to social events. Annual dinner guest speaker, Sherman Rogers, American Foundation, New York, will discuss, "Necessity for Understanding Men, and Where Do We Go from Here."

The Friday morning session will be addressed by James H. Lansing, the society's shop practice engineer, on results of the sand survey and the summer technical training course; Leon J. Wise, Chicago Malleable Castings Co., on research and product improvement; John A. Wagner, Wagner Malleable Iron Co., Decatur, Ill., on revision of the cost manual; Anthony Haswell, Dayton Malleable Iron Co., Dayton, O., on hourly earnings and the work week. The guest speaker at this session will be Stanley A. Knisely, director of advertising, Republic Steel Corp., Cleveland, on "Industrial Sales Promotion."

Saturday's morning session will hear discussion by Enrique Touceda, the society's consulting engineer, on action of lead on malleable iron, effect of phosphorus at sub-zero temperatures and specific values of tensile properties. Federal legislation and the Washington situation will be discussed by Arthur F. Jackson, Michigan Malleable Iron Co., Detroit, and Robert E. Belt, the society's secretary. Publicity and market developments will be discussed by E. E. Griest, Fort Pitt Malleable Iron Co., Pittsburgh, and James L. Cawthon Jr., development engineer of the society.

HARD-SURFACE TOUGH-CORE *perfectly joined in*



Teeth twisted .040" out of line with no sign of cracking or spalling. Solid black lines show original alignment of teeth before twisting.

Large section of fractured rim from S.A.E. 4615 "FIVE-POINT" DEEPHARD STEEL Timing Gear which was demolished in a breakdown test. Shows manner in which rim was bent and twisted to obtain smaller specimens.

Note the penetration of every fracture into and through the core without evidence of flaking and spalling.

'FIVE-POINT' *Deephard* STEEL

HERE is convincing proof of the remarkable fusion of the wearing surface hardness with the core — and of core ductility and toughness — that are found in all "FIVE-POINT" DEEPHARD STEEL products. The section of fractured rim illustrated above clearly shows the value of this ductility and toughness, and gradual and even fusion between surface hardness and core — without these qualities the teeth of this gear could not have withstood such distortion before fracturing . . . note that the fractures go into and completely through the core without flaking and spalling.

"FIVE-POINT" DEEPHARD STEEL *can be used and will do a better job wherever there is a problem of combating abrasive surface wear, shock and fatigue. It is a "hard surface" steel that is one "solid piece"— not a two-layer steel having a case and core.*

IXL 'FIVE-POINT' *Deephard* STEEL

Write today for catalog on "FIVE-POINT" DEEPHARD STEEL. Our engineering department is at your service in adapting this superior product to your problems of wear-life and strength.

"FIVE-POINT" SUPERIORITY

1. **Increased hardness in wearing surface without fear of spalling or flaking.**
2. **Complete control of and greater depth to this hardness.**
3. **Gradual and even fusion of wearing surface with core.**
4. **Higher core area physical properties.**
5. **Metallurgically the finest grain structure throughout for wear, fatigue, and shock resistance.**

FOOTE BROS. GEAR AND MACHINE CORPORATION
5311 SOUTH WESTERN BOULEVARD CHICAGO, ILLINOIS

Editorial

Trend Is Toward Curbs on Labor Abuses

■ UNDER a normal concept of life everybody has to work to earn a living. The general process by which everybody works to earn a living, through rendering services of vast variety, constitutes the composite fabric known as "business." Hence, any factor that hampers or discourages business immediately becomes important to the average citizen because it affects his ability to earn a living. The average citizen is not always quick to realize the full significance of such factors. When he does finally come to a realization and forms a positive impression as to what kind of a cure should be applied, action is not long in coming.

There have been many indications during the past year that the average citizen is not satisfied with the present condition of business. He realizes that current conditions are such as to handicap business and make it difficult for him to earn a living.

Corrective Measures Appear First Where Unions Were Liberally Treated

There are indications that the average citizen has progressed in considerable degree toward a realization that business has to be conducted at a profit if it is to be healthy and provide employment in desired volume. The trouble is that the average citizen is confused as to the correctives that should be applied and that political officeholders, therefore, are more inclined to listen to organized pressure groups with selfish interests. But in the long run the will of the average citizen is bound to prevail.

One of the reassuring manifestations at this time is the growing impatience on the part of the average citizen over domineering and destructive tactics of some labor organizations. They take the form (STEEL, May 15, page 23) of state and local legislation that limit picketing, restrict strike action and curb other activities. The most drastic restraints, significantly, have been imposed by those states noted earlier for liberal treatment of labor unions. Farmers have played an important role in initiating and supporting anti-union laws. These laws and ordinances have resulted in the main not from "legitimate" union activities concerned with wages, hours and working conditions, but with abuses of power by union leaders.

Tide of Regulation Spreads As Sounder Thinking Prevails

Oregon, Minnesota, Oklahoma, Wisconsin and Pennsylvania are the states that so far have enacted such legislation. Attempts to pass similar legislation in California and Washington lost by small margins. Restrictive bills now are pending in 9 other states. Los Angeles, Flint, Mich., and some other small cities and rural counties have adopted ordinances that regulate union activities. In contrast, not a single one of the "little Wagner acts" introduced in various state legislatures has been passed and only one state, New Mexico, has enacted an anti-injunction measure.

It may take a long time for the average citizen to discover the exact nature of deterrents to business and do something about them. But in the long run he can take care of himself. There is reason for confidence that ultimately will come a complete reversal from the unsound thinking that has been so large a factor in blighting the average citizen's earning power through recent years.

The BUSINESS TREND

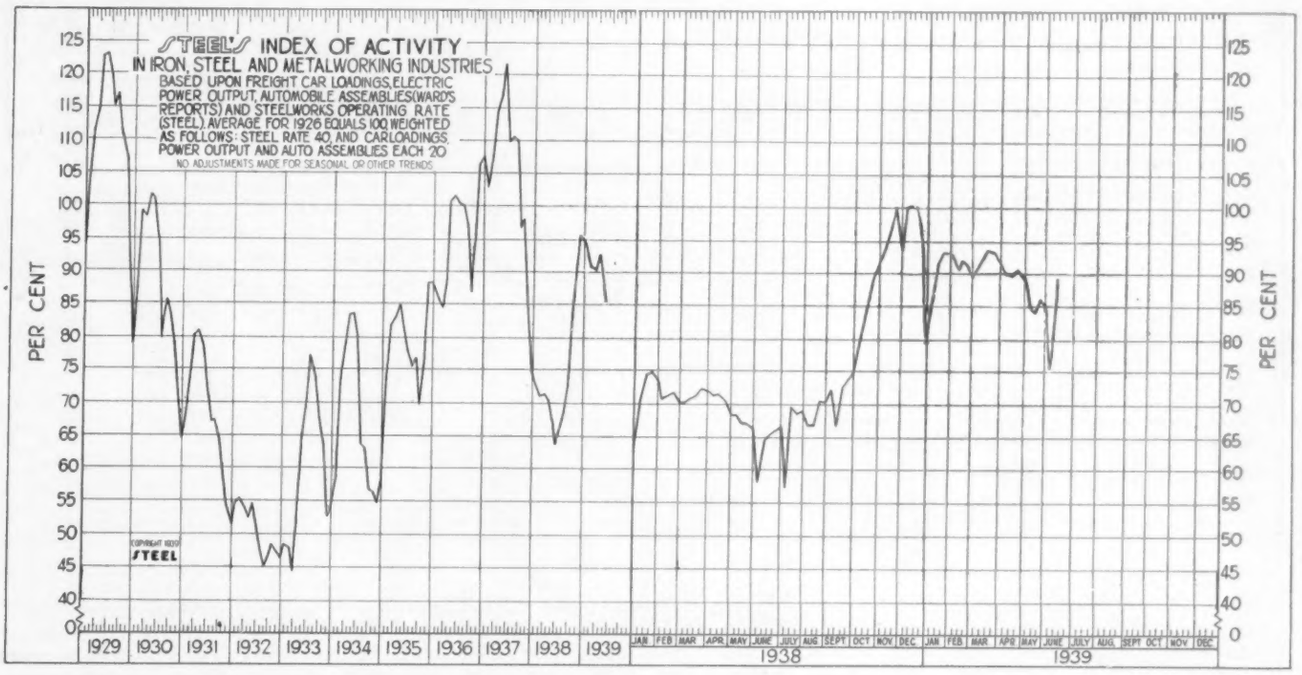
Index of Activity Rebounds Sharply After Holiday Week

■ THE rebound of industrial activity from the holiday week has gone far in bolstering the confidence of many industrial leaders. Activity in the iron, steel and metalworking industries as recorded by STEEL's index not only regained all the ground lost in the Memorial day week but is also at the highest level since the week ended April 29.

The index now stands at 88.2, a gain of 12.3 points over the preceding week. In the comparable week last year the index stood at 64.4. All of the four business indicators composing the index registered encouraging gains in the latest week.

Steelmaking operations recorded the third consecutive weekly increase to 53.5 per cent. This recent advance represents a total increase of 8 points since the low point this year of 45.5 per cent registered in the week ended May 20. Current indications point to a leveling off in steelmaking operations through the remainder of this quarter.

Renewal of the regular schedules after the holiday week, together with the settlement of the Briggs strike acted jointly in restoring automobile schedules to the 65,000-car level in the week ended June 10. Total output in that week of 65,265 units more than doubled the Memorial week volume of 32,445 and remains well above the comparable week last year of 40,175. The reopened


STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL). AVERAGE FOR 1926 EQUALS 100 WEIGHTED AS FOLLOWS: STEEL RATE 40, AND CARLOADINGS, POWER OUTPUT AND AUTO ASSEMBLIES EACH 20
NO ADJUSTMENTS MADE FOR SEASONAL OR OTHER TRENDS
PER CENT
COPYRIGHT 1939 STEEL
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939
1938
1939

STEEL'S index of activity gained 12.3 points to 88.2 per cent in the week ended June 10:

Week ending	1939	1938
Mar. 25	93.2	72.4
April 1	92.2	72.0
April 8	90.0	71.3
April 15	89.7	71.4
April 22	90.4	70.8
April 29	89.2	68.4
May 6	85.1	68.5
May 13	84.2	67.2
May 20	86.6	67.1
May 27	85.4	66.5
June 3	75.9	58.1
June 10	88.2	64.4

Mo. Data	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Jan.	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
Feb.	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
March	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
April	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
May	85.3	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
June	....	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
July	....	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
Aug.	....	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Sept.	....	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Oct.	....	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Nov.	....	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
Dec.	....	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

Ford plants were the largest factor in the advance, but nearly all assembly lines were moving at a quickened tempo. May retail car deliveries were encouraging and in at least one instance exceeded that of April. Field stocks which were somewhat out of line at the end of April have been reduced to more normal levels as a result of the contra-seasonal delivery rise during May.

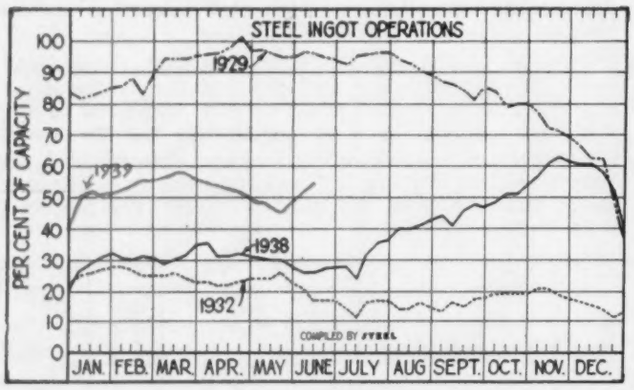
Electric power output in the week ended June 10 advanced to the highest level since the middle of February. Power consumption in latest week of 2,256,823,000 kilowatt-hours compares with 2,113,887,000 in the holiday week. Revenue freight carloadings increased to 634,597 cars in the week ended June 10, thus regaining the loss incurred in the preceding week. In fact the latest advance forced this important business indicator to a new high for the year.

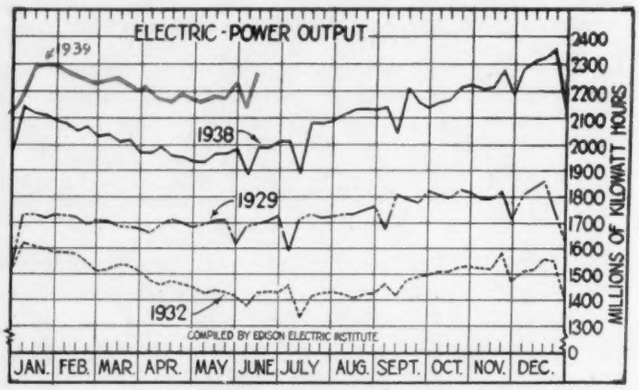
MAY INGOT OUTPUT DECLINES

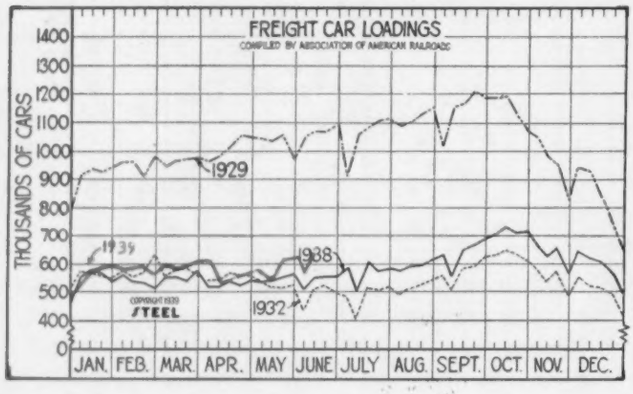
The daily average ingot production during May was 108,069 gross tons, based on the total output for the month of 2,917,876 gross tons reported by the American Iron and Steel institute. This compares with a daily average of 119,479 in April and 72,272 tons in May, 1938. Ingot operations last month averaged 48.24 per cent of capacity, lowest rate this year, compared with 50.99 in April and 30.30 per cent in May of last year. For the five months this year ingot production totaled 15,499,546 tons, or an increase of 69.3 per cent over the 9,155,740 tons of ingots produced in the comparable period last year.

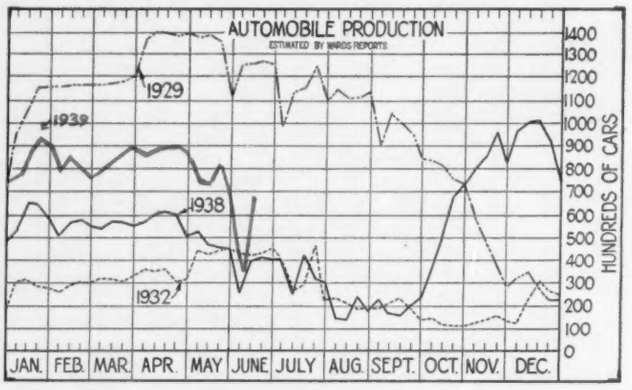
MACHINE TOOL INDEX IN SHARP GAIN

The monthly orders index of National Machine Tool Builders' association during May advanced to the highest level since April, 1937. Renewed forward swing in both domestic and foreign orders in May carried the monthly index to 219.8, a gain of 64.2 points over the preceding month. At this point the index is within the average range for 1937. The three months moving average index of orders recorded the sixth consecutive monthly increase during May to 186.9, up substantially from the 169.4 level in April and is more than double the 88.0 registered by the index in May, 1938. The three months moving average index is at the highest level since November, 1937.

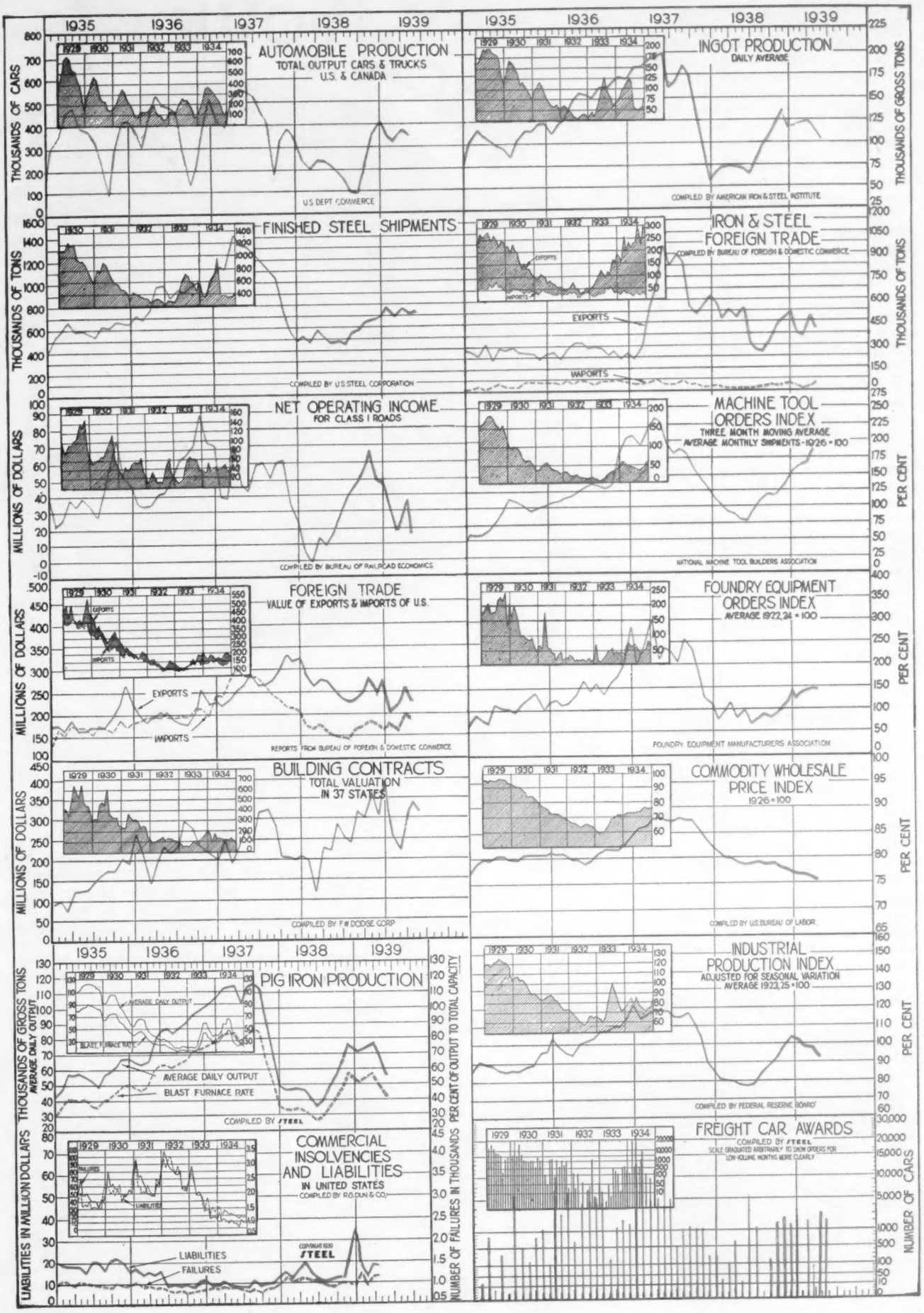








Week ending	Steelworks Operating Rate Per Cent 1939	1938	1932	1929	Electric Power Output Million KWH 1939	1938	1932	Freight Car Loadings Thousands of Cars 1929	1939	1938	1932	1929	Weekly Auto Output 1939	1938	1932	1929
Feb. 18	55.0	31.0	25.0	88.0	2,249	2,059	1,545	1,718	580	536	572	958	79,860	59,100	30,410	116,500
Feb. 25	55.0	30.5	25.0	83.0	2,226	2,031	1,512	1,699	561	512	636	907	75,660	56,977	30,150	116,500
Mar. 4	56.0	29.5	25.0	89.5	2,244	2,036	1,519	1,707	599	553	560	977	78,705	54,440	31,390	116,500
Mar. 11	56.5	30.0	25.5	94.5	2,238	2,015	1,538	1,703	592	557	575	946	84,095	57,438	31,110	116,500
Mar. 18	56.5	32.0	24.5	94.5	2,225	2,018	1,537	1,687	594	540	585	958	86,725	57,558	30,590	117,000
Mar. 25	55.5	35.0	23.0	94.5	2,199	1,975	1,514	1,683	605	573	561	961	89,400	56,800	32,892	117,500
Apr. 1	54.5	36.0	23.0	95.0	1,210	1,979	1,480	1,680	604	523	545	967	85,980	57,500	35,756	120,000
Apr. 8	53.5	32.0	22.0	95.5	2,173	1,990	1,465	1,663	535	522	545	956	87,019	60,975	35,390	138,417
Apr. 15	51.5	32.0	22.0	96.0	2,171	1,958	1,480	1,697	548	538	567	972	88,050	62,021	35,778	140,822
Apr. 22	50.5	32.5	23.0	98.0	2,199	1,951	1,469	1,709	559	524	562	1,004	90,280	60.563	30,672	140,290
Apr. 29	49.0	32.0	24.0	101.0	2,183	1,939	1,445	1.700	586	543	554	1,052	86,640	50,755	31,121	139,732
May 6	49.0	31.0	24.0	97.0	2,164	1,939	1,429	1,688	573	536	534	1,050	71,420	53,385	43,899	140,672
May 13	47.0	30.0	24.0	97.0	2,171	1,968	1,436	1,698	555	542	517	1.048	72,375	47,415	42,587	138,541
May 20	45.5	30.0	25.5	96.0	2,170	1,968	1,435	1,704	616	546	516	1,046	80,145	46,810	43,470	139,528
May 27	48.0	28.5	23.0	95.0	2,205	1,973	1,425	1,705	628	562	521	1,061	67,740	45,120	45,121	136,032
June 3	52.0	25.5	21.0	95.0	2,114	1,879	1,381	1,615	568	503	447	972	32,445	26,980	44,116	111,372
June 10	53.5	25.5	17.0	96.5	2,257	1,992	1,435	1,690	635	554	502	1,055	65,265	40,175	43,491	125,307


1935 1936 1937 1938 1939
AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS U.S. & CANADA
THOUSANDS OF CARS
U.S. DEPT COMMERCE
INGOT PRODUCTION
DAILY AVERAGE
THOUSANDS OF GROSS TONS
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
FINISHED STEEL SHIPMENTS
THOUSANDS OF TONS
COMPILED BY U.S. STEEL CORPORATION
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
NET OPERATING INCOME
FOR CLASS I ROADS
MILLIONS OF DOLLARS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS 1926 = 100
PER CENT
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1922,24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
BUILDING CONTRACTS
TOTAL VALUATION IN 37 STATES
COMPILED BY F.W. DODGE CORP
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923,25 = 100
COMPILED BY FEDERAL RESERVE BOARD
PIG IRON PRODUCTION
THOUSANDS OF GROSS TONS AVERAGE DAILY OUTPUT
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
PER CENT OF OUTPUT TO TOTAL CAPACITY
COMPILED BY STEEL
COMMERCIAL INSOLVENCIES AND LIABILITIES
IN UNITED STATES
COMPILED BY R.G. DUN & CO.
LIABILITIES IN MILLION DOLLARS
NUMBER OF FAILURES IN THOUSANDS
LIABILITIES
FAILURES
COPYRIGHT 1939 STEEL
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW-VOLUME MONTHS MORE CLEARLY
NUMBER OF CARS

"WHAT PRICE POUNDS" For M

■ This question recently was raised by an executive of a large company engaged in mass production of metal products: "Why—throughout a period when price per pound for automobiles and electrical equipment has dropped steadily—should the price per pound for machine tools have trended upward?"

To get to the bottom of this situation it is desirable to take a look at the records, but first let me tell a story. Once upon a time (let us say in June of 1849) a locomotive manufacturer had occasion to buy a machine tool. Upon being quoted $1120 for the 2240-pound machine, he did some quick mental figuring, then came back at the machine tool salesman with something like this: "Outrageous! Since when have you been charging 50 cents a pound for machine tools made out of pig iron that costs your company only $23 a gross ton?"

Conditions existing in the early days of the machine tool industry were such that this "price per pound" idea took root in the minds of machine tool users without resistance on the part of the few and scattered machine tool builders. Many of these early builders had very small organizations and were in the foundry business. Their men worked long hours for as little as $1.00 per day and it is no exaggeration to add that the working proprietor of the business not infrequently contributed his own expert services for as little as $3.00 per day.

Overhead Was Overlooked

There was little or no understanding of overhead. Even direct waterpower, then very commonly used, was considered a providential gift. Ingenuity and engineering ability were given away—a peculiar form of benevolence which was to persist in the machine tool industry for many years to come.

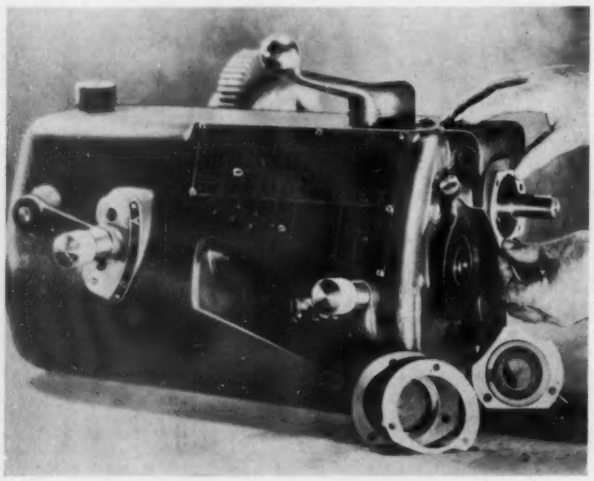
But what of the machine tool men themselves? They were men of simple tastes. They took real pride in their work. Therefore they were content with the very modest living which they earned. Even today the average net profit of the machine tool industry as a whole probably does not exceed 4 per cent.

In the meantime, however, many other industries which were dependent either wholly or in part upon machine tools, grew large and prosperous. At the same time they demanded more and more from machine tool builders in the way of accuracy, operating convenience and production speed. Little by little machine tool builders awoke to the fact that manufacturers of locomotives, agricultural machinery, sewing machines, etc. were getting more per pound for their machine-made products than the machine tool industry was getting for its necessarily hand finished precision machinery.

With the metalworking industries in America growing by leaps and bounds because of the interchangeable system of manufacture which machine tools made possible, machine tool builders were forced to pay their own highly skilled workmen much higher wages to keep them from being drawn into the mass production shops. Dependable steam power replaced the uncertain propulsion of individual waterwheels. Coal cost money. Thus power became recognized as a part of manufacturing cost.

It began to dawn upon machine tool builders that they themselves were more than mere converters of iron and steel into common machinery. They realized they were adding greatly to the national wealth through their peculiar ability to design and build a very special kind of machinery which in turn would produce a wide variety of other machinery and metal products profitable to machine tool users and of definite public benefit.

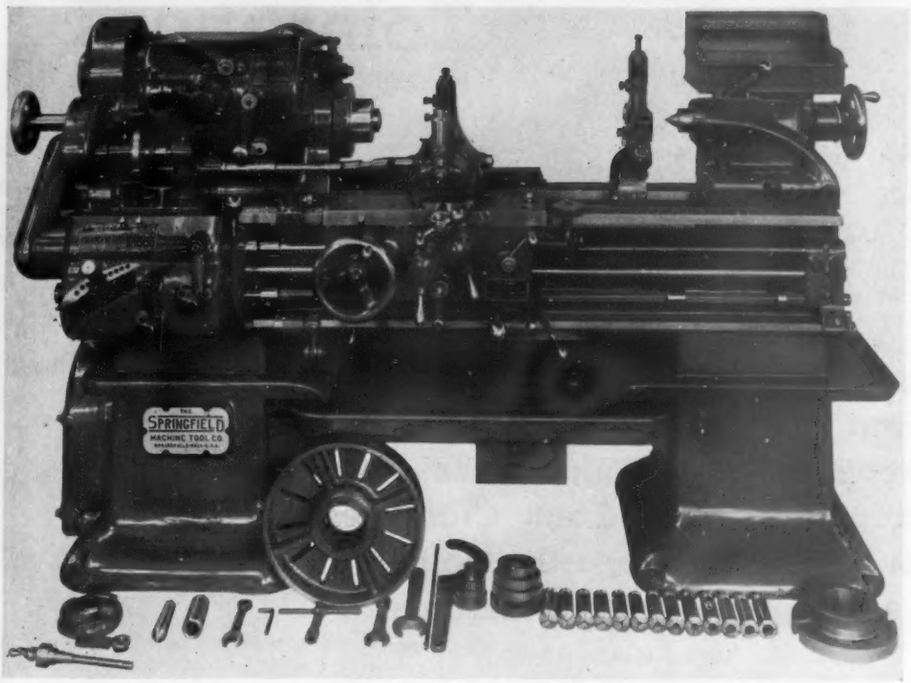
Rather timidly, and never rapidly



Compact quick change feed box—an intricate mechanical unit in itself—has generally been substituted for cheap, but inconvenient and sometimes hazardous arrangements of pick-off gearing

By GUY HUBBARD
Machine Tool Editor

Modern Machine Tools?



Modern motor driven geared head engine lathe (above) obviously is more expensive to build than simple cone head machines of 25 years ago—shown in circle at left. However, figured on basis of "cost per piece" instead of by archaic "price per pound" formula, the modern machine tool represents an extremely profitable investment where low cost high quality production is involved

nor to any excessive degree, machine tool prices were lifted off the rock bottom on which they had rested so long. Eventually there came a day when purchasing agents, for quick figuring on their detachable cuffs when bargaining with machine tool salesmen, began to use $1.00 per pound as the base figure for checking quotations. That persisted long after automobile buyers had begun sharply to question automobile salesmen as to how many miles at how few cents per mile they might expect from the machine-made automobiles offered for their consideration. The automobile prospect was interested in the price, but not in the price per pound. What he was after was the price per mile.

Now we can get back to the original question "Why—throughout a period when price per pound for automobiles and electrical equipment dropped steadily—should the price per pound for machine tools have trended upward?" If we must persist in thinking in pounds, here is the obvious answer: "It has cost more and more to develop and build the constantly improved and increasingly specialized machine tools which have made possible the mass production of better and better automobiles and electrical equipment at lower and lower cost!"

To illustrate this situation it is not necessary to go into details as to increasing demands by machine tool users for machines which in one way or another depart from standard designs. It is not necessary to dwell on the cost of hydraulic and electrical control apparatus. It is not necessary to explain to great length why it costs so much more to build a machine tool capable of working to "tenths" than it did a previous model accurate only to "thousandths." I will not even go into details regarding added expense involved in building machine tools capable of utilizing cemented carbide tools efficiently. I will simply mention a few simple facts regarding the engine lathe.

In the circular illustration is shown the lathe department of a well known machinery plant as it appeared 25 years ago, this in its day being considered a very well equipped department. All this long since has been done away with. The company scrapped all this equipment and re-established the department in a new building equipped with modern motor driven geared head lathes.

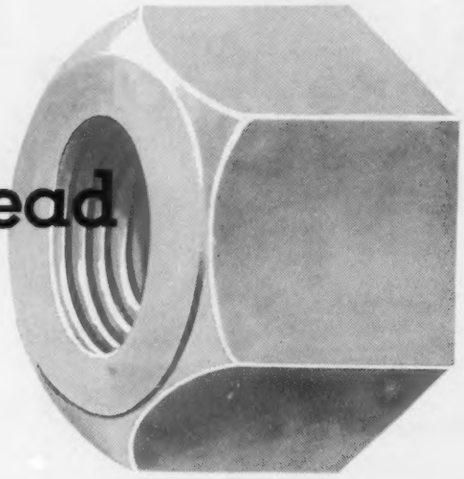
The new lathes undoubtedly cost much more per pound than did the old ones, but the company was not concerned with "price per pound"—they had to have lathes which would turn out better work faster than the old ones could. The new machines were sold to them on a "guaranteed performance basis," that they would pay for themselves well within their useful life.

Improvements Are Expensive

The illustration on this right hand page, showing a modern motor driven geared head lathe with quick change feed and numerous other refinements, should prove even at a glance why "it costs more per pound" than a lathe of 25 years ago. Compare the cheap but cumbersome arrangement of cone pulleys and countershaft with the much more expensive, compact, quick change geared head—but think of the tremendous improved operating characteristics of the latter. Compare the cheap but primitive pick-off change gear arrangement of the old machines with the quick change feed works and lead screw drive of the new lathe. A modern quick change feed box, such as that shown in the course of assembly on the left hand page, costs almost as much to build today as did a complete small size lathe in the early days of the industry. Even the cast iron which goes to make up a large proportion of the weight of a lathe, no longer is ordinary cast iron as of old. It is a special, hard, high tensile alloy, infinitely better for its purpose.

I might continue in this vein for several pages. That however would be entirely out of line with the following sound advice given recently by Wendell E. Whipp, president of the National Machine Tool Builders' association, to the Associated Machine Tool Dealers: "Let's get away from all this talk about fine castings, ground shafts, etc., except as they may directly contribute profit to the user. We are all 'profit engineers' now. If we follow this plan consistently, the buyer who harks back to the old 'price per pound' formula will become extinct."

Nut Thread Tolerances



Need for adjusting standard specifications for commercial nut threads to more nearly represent good practice from manufacturer's as well as user's standpoint is pointed out. Close limits increase cost all out of proportion to slightly improved characteristics obtainable

By WM. C. STEWART
Technical Adviser
American Institute of Bolt, Nut & Rivet Manufacturers
Cleveland

■ DURING THE past few years, bolt manufacturers and users of nuts have shown an increasing interest in the subject of nut-thread tolerances and gaging. There has been much misunderstanding as to what degree of thread accuracy may be produced economically and what is really required to provide satisfactory service. While little trouble has been experienced with nut threads in actual service, present theoretical specifications for thread tolerances, especially with recent changes in gaging practice, do not represent either what is actually produced or what is needed for satisfactory use.

Manufacturing Limitations

There are some manufacturing limitations encountered in nut tapping. Nuts are tapped in a variety of machines using taps which for practical reasons are solid so no adjustment of dimensions can be made. Accuracy of nut thread thus is limited by variations encountered in the taps themselves. Only practical way to reduce this variation is to sort taps, which is expensive because of loss in rejected taps and in production time while experimenting.

There are other variations due to the process itself. Commonly used tapping machines employ a more or less flexible tap, the cutting end of which is not rigidly held but floats and centers itself as best it can through a series of nuts which are supported only by being held relatively loosely in a flat-sided passageway. Other variations are encountered due to the commercial variation in width across wrench faces of the nut, lack of parallelism between top and bottom faces of nuts, inaccuracies due to hole in nut being off center, tapered, out of round or not perpendicular to top and bottom faces of the nut. Accuracy of nut threads, therefore, is limited by these factors and by the somewhat random course of the tap in passing through a series of nuts.

In addition, there is a progressive change in nut thread dimensions caused by wear on the tap.

Nut thread form is shown in Fig. 1 which illustrates the tightest and loosest nut. The tolerance allowed is shown in solid black. It should be noted that the thread is flattened more at the minor diameter than at the major diameter.

A thread is specified by nominal number of threads per inch and by limits on three diameters, pitch diameter, major diameter and minor diameter. Pitch diameter is defined as diameter of an imaginary cylinder, the surface of which would pass through the threads at such points as to make equal the width of the threads and the width of the spaces cut by the cylinder surface. For example, in Fig. 1 distance a-b is equal to distance b-c.

No Limits For Thread Sides

No specific limits are given for angle between sides of threads or the lead (distance a nut moves along a bolt in one revolution). Variations of these elements are controlled by tolerances allowed for pitch diameter. If errors exist in

Abstracted from paper given before American Institute of Bolt, Nut & Rivet Manufacturers at Cleveland, March 23, 1939.

TABLE I

American Standard Pitch Diameter Tolerances and Possible Loss due to Tap and Gage Errors

Nominal Nut Size	American Standard Pitch Diameter Tolerance Class 1	Class 2	Class 3	Pitch Diameter Tolerance lost due to Tap and Gage Errors Maximum Cut Th'd Tap	Ground Th'd Tap	German Coarse Fit Pitch Diameter Tolerance
¼	.0051	.0036	.0026	.0052	.0024	.0072
⅜	.0063	.0045	.0032	.0060	.0027	.0083
½	.0074	.0052	.0037	.0075	.0031	.0092
⅝	.0085	.0059	.0042	.0084	.0040	.0100
¾	.0092	.0064	.0045	.0098	.0044	.0105
1	.0111	.0076	.0054	.0113	.0050	.0117
1¼	.0124	.0085	.0059	.0134	.0057	.0126
1½	.0145	.0101	.0071	.0151	.0066	.0136
2	.0184	.0127	.0089	.0187	.0077	.0157

lead or angle, pitch diameter of nut must be larger than minimum specified in order to pass a "go" gage. If errors are excessive, the pitch diameter required in the nut to permit entrance of a "go" gage will exceed the maximum permitted by specifications and the nut will be rejected by the "no-go" gage. Fig. 2A shows a "go" gage, of perfect thread angle and lead, fitted to a nut thread which is correct in angle but has a slight lead error. If these threads are to engage without interference, the pitch diameter of the nut must be larger than that of the gage by a small amount. This amount is an equivalent reduction in available pitch diameter tolerance to compensate for lead error.

Angle Error Reduces Tolerance

Similarly, Fig. 2B shows the effect of an error in angle of thread which is to further reduce the tolerance available for actual pitch diameter variations.

In case the gage is in error, the loss of pitch diameter tolerance would be greater in proportion. The loss of available pitch diameter tolerance actually depends upon the difference in angle and lead between gage and nut. However, lead and angle of the nut thread cannot be more accurate than that of the tap. Thus, this loss of pitch diameter tolerance is dependent to a large extent upon errors in commercial taps and gages.

Table I shows amount of pitch diameter tolerance lost due to pitch diameter, lead and angle errors of commercial taps and gages compared with the tolerances allowed in present American standards and with German coarse fit standards. Loss of pitch diameter tolerance is, of course, the sum of various errors. These would not necessarily have their maximum values simultaneously, but since it is possible for this condition to exist, this maximum must be provided in specifications if nuts are to pass inspection.

It will be noticed from Table I that loss of pitch diameter tolerance, with commonly used cut-thread taps, is slightly greater than the available Class 1 tolerance. This leaves less than nothing for ordinary manufacturing variations and for tap wear. This discrepancy is intensified by the fact that nuts made close to the tightest permissible limit are unsatisfactory in service because they interfere with ready assembly in high-speed mass-production operations. For this reason, manufacturers have learned to avoid the tighter limit. It is evident that it is difficult to meet Class 1 tolerances consistently.

With the use of a more accurate ground thread tap, the loss of pitch diameter tolerance is approximately equal to the available Class 3 tolerance, leaving nothing to account for manufacturing variations and tap wear. The more liberal Class 2 tolerances might be met with ground thread taps, but it would be expensive and would require tapping machines and blank nuts in the best possible condition, slower tapping speed, shorter tap life and probably sorting of taps. It is evident from the above that it is impractical to meet Class 3 tolerances. Even with ground thread taps and a closely controlled tapping process, it would be necessary to gage every nut and discard those not meeting specifications.

Purpose of gaging is to insure that a nut thread will assemble properly with standard bolt thread. A "go" gage is used to prove that the nut is not too small to assemble. This gage is a plug having threads accurately made to minimum dimensions of the nut thread. It must enter the nut all the way if nut is to be satisfactory. Successful interchangeable manufacture has been carried on for years with the use of "go" gages only. The looseness being controlled by the tap itself. With a properly made tap, the nut cannot be materially larger than tap. As the tap wears, succeeding nuts become smaller until too small to pass the "go" gage, at which point the tap is discarded. Such gaging is satisfactory for the great bulk of nut production, especially since more service difficulties are the result of nuts being too tight rather than too loose.

When various classes of tolerances were specified, it became necessary to use a "no-go" plug gage to

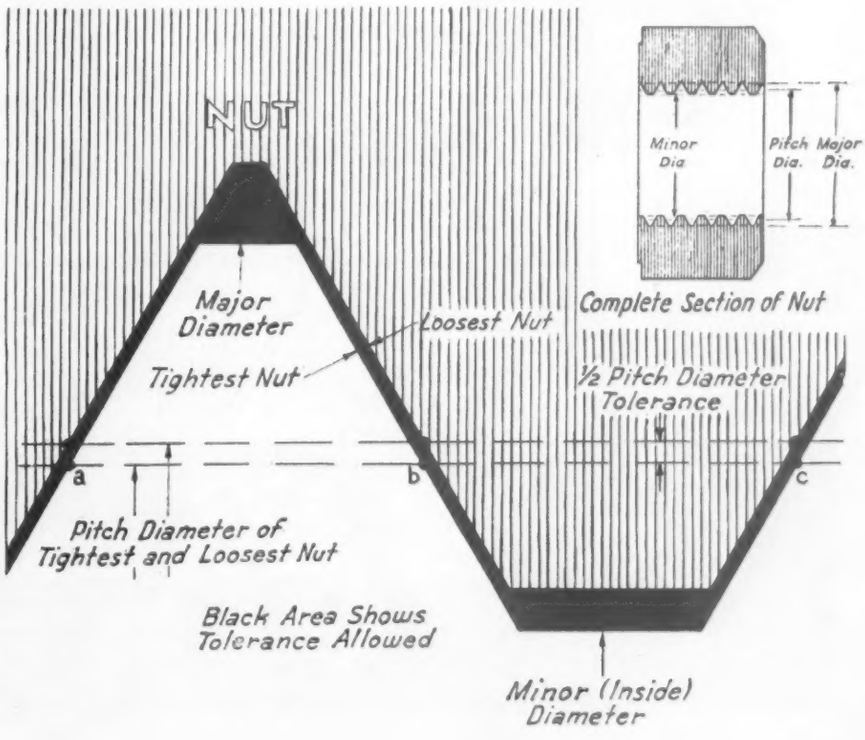


Fig. 1—Nut thread form and tolerances

prove that the nut thread was not larger than some arbitrary maximum limit. A "no-go" plug gage is made to maximum limits of the nut and should not enter the nut more than an arbitrary limit of 1½-turns on inspection. "No-go" limits of nut threads are neither as important from a service standpoint nor as susceptible to accurate measurement by plug gages as are "go" limits. When an accurate "go" gage enters the nut all the way, no element of the nut thread is too small since this checks all elements of the thread. A "no-go" gage checks one element only, the point at which interference between the nut and gage thread occurs.

Full-Form No-Go Gage

The full-form "no-go" gage in common use has thread dimensions following the profile of the standard screw thread except that crest of thread is cut off so outside diameter of gage thread is not greater than that of the "go" gage. Crest of the thread was cut off to insure that the required interference between "no-go" gage and nut will occur on flank of nut thread and not at the crest which may be rounded slightly due to tap wear. Such a gage has been used for those special applications where maximum size of nut thread must be controlled closely. Design of these gages is described in the 1928 report of National Screw Thread Commission.

Recently the truncated "no-go" gage has come into use. This gage, described in the 1933 report of National Screw Thread Commission, differs from the full-form gage in that crest of the thread is cut off or truncated considerably more than was that of the full-form gage. This is to insure that the required interference with the nut thread occurs not only on the flank rather than at the crest of the thread, but at a point closer to the pitch line so the gage will measure more nearly the pitch diameter. The truncated gage rejects many nuts which will pass the full-form gage and which are satisfactory from a service standpoint.

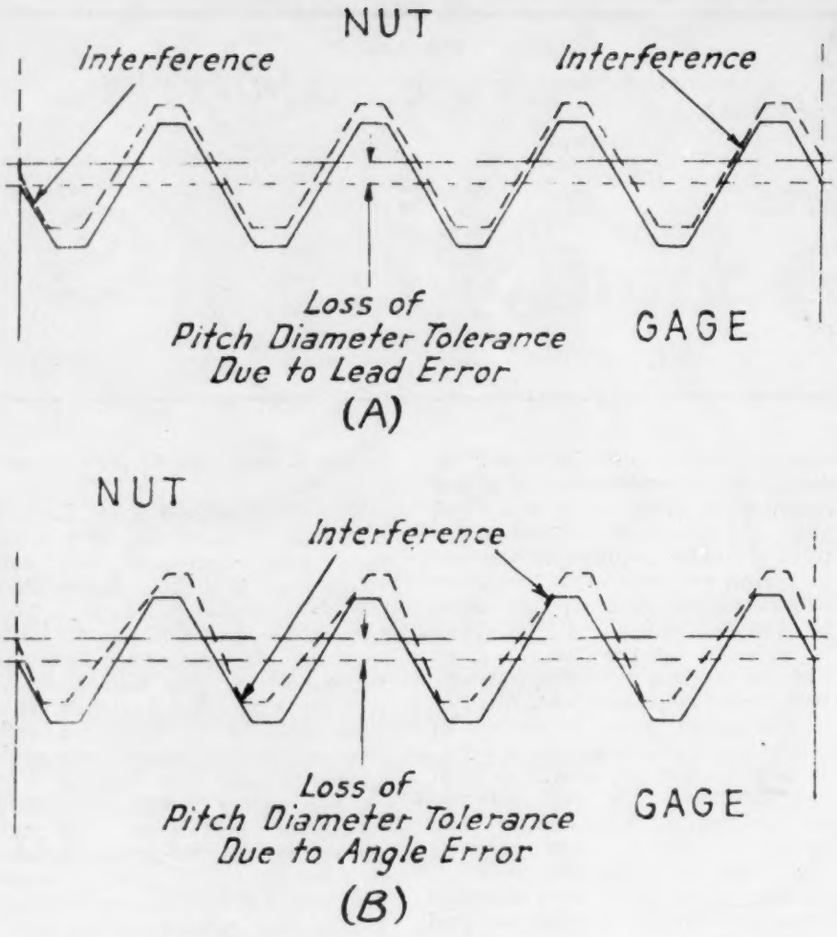


Fig. 2—Effect of lead and angle errors

Truncation of crest of gage thread would have no effect on rejections of nuts if both gage and nut threads were perfect in thread form. Such perfection, however, is impossible to maintain either in gage or nut threads. The thread element principally responsible for rejects by the truncated gage is the angle. The half-angle of the gage thread may be in error by 15 degrees and that of the tap may be in error by 45 degrees. Thus, it is possible to have a difference in thread half-angle between nut and gage of 1 degree, due solely to errors in gage and tap. This difference is increased as nut thread angle tends to be larger than that of the tap, due to wobbling of tap and nut during tapping. Thus, average nut thread angle is apt to be slightly larger than 60 degrees. Difference in angle between gage and nut in normal practice may be as much as 2 degrees.

Effect of truncation of the gage

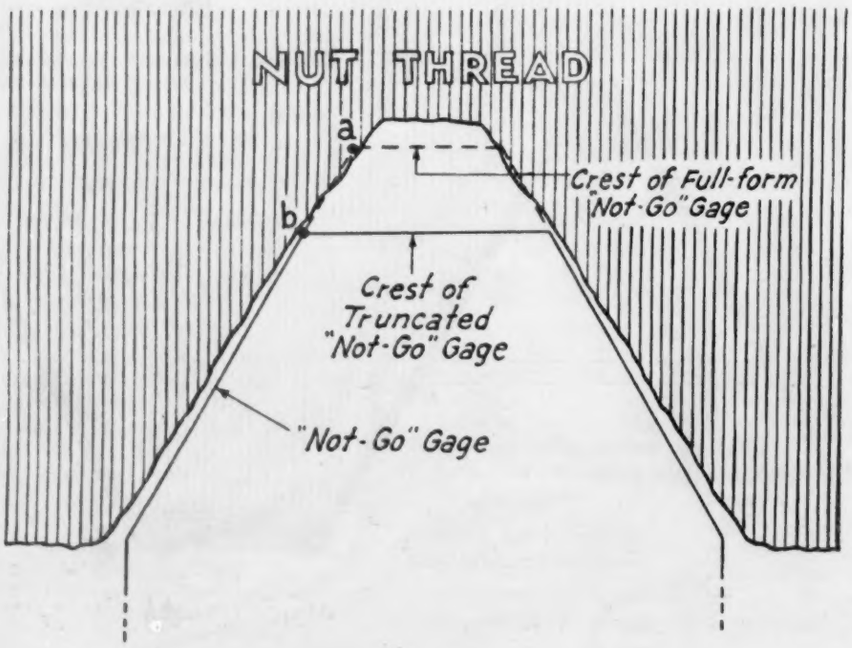
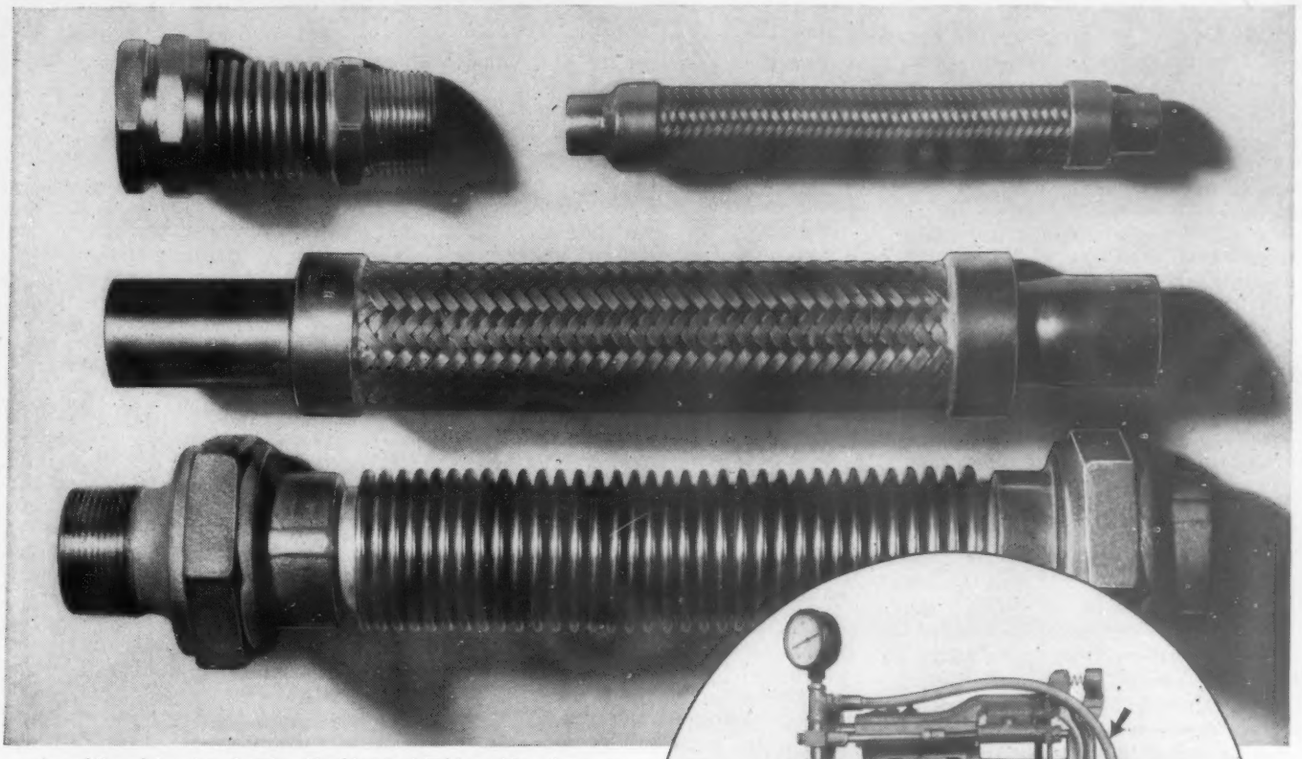


Fig. 3—Effect of truncated gage

Seamless *Flexible* Connectors

...THE SAFETY LINK BETWEEN TWO MOVING PARTS



Assemblies of American Seamless Flexible Metal Tubing with various types of end fittings used as leak-proof flexible connectors for taking up vibration, misalignment, etc.

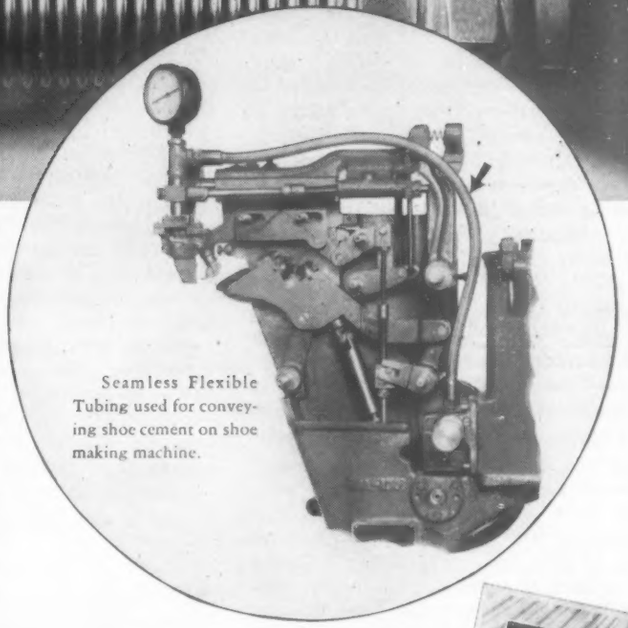
THE installation of American Seamless Flexible Metal Tubing is cheap insurance against the need for future servicing. Wherever you need a flexible connector or conductor . . . for misaligned or moving parts, for absorbing vibration . . . the one best answer lies in the use of American Seamless Flexible Metal Tubing.

There are no joints, welds, laps, seams or packing where leaks can occur. For the conveyance of air, water, oil, steam or fuel, this flexible tubing has no superior. That's why more and more designers of machinery and maintenance engineers are specifying "American Seamless."

Write us about your connector problems. Our engineering department has a wealth of information on the use of "American Seamless" on all types of machinery. Consultation of this department entails no obligation.

ANACONDA
from mine to consumer

39345



Seamless Flexible Tubing used for conveying shoe cement on shoe making machine.

FREE REFERENCE HANDBOOK ON SEAMLESS FLEXIBLE METAL TUBING

The most dependable *flexible* connector for conveying liquids or gases under high pressures...made from special *seamless* tubes of any workable metal. Handbook contains descriptions, illustrations and valuable engineering data. Write for Bulletin SS-3.

American Metal Hose

ANACONDA
from mine to consumer

AMERICAN METAL HOSE BRANCH of THE AMERICAN BRASS COMPANY

General Offices: Waterbury, Conn. • Subsidiary of Anaconda Copper Mining Company

In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

produced by difference in angle between gage and nut thread is illustrated in Fig. 3, which shows a nut thread in irregular outline and with a thread angle differing slightly from that of the "no-go" gage. Both full-form and truncated "not-go" gages are illustrated. Note that nut thread interferes with full-form "no-go" gage at point "a," so that nut is acceptable to a full-form gage. No interference takes place with the truncated gage as there is a clearance at point b, so nut would be rejected. In any lot of nuts accepted by a full-form gage, a large percentage will be rejected by a truncated gage. Thus, use of a truncated gage substantially reduces permissible manufacturing tolerances. It also materially increases rejections of nuts heretofore acceptable.

Thread Strength

Will strength of the joint between nut and bolt against stripping be improved by maintaining closer tolerances on the nut even though this means a material increase in cost? This is a hypothetical question since nut proportions have been so established that resistance to stripping of threads is much greater than breaking strength of the bolt, even with a looser thread fit than is commercially produced. Thus strength of the threaded joint is not ordinarily the limiting factor determining strength of a bolted connection.

Fig. 4 represents the loosest fit between a Class 2 bolt and Classes 1 and 2 nut. Black area shows metal added to a Class 1 nut to produce Class 2. The working load is transferred across the section c-b.

Failure of threads between bolt and nut occurs by shearing of bolt thread at a-b, the minimum shearing area. Shearing would not normally occur in the nut at section c-d, as this section is larger because it is at a greater diameter and also is larger because of the greater depth of thread on the bolt. These two effects give approximately 30 per cent increase in shearing area for section c-b. Inside diameter of nut, which determines minimum shearing section a-b, is the same for all classes of tolerances. Thus, strength of joint is not increased for ordinary materials by maintaining Class 2 tolerances on the nut. Nothing useful has been gained by adding the small amount of metal shown by the heavy black area to produce Class 2 tolerances. Metal added does not contribute to joint strength. The same conclusions are reached if Class 3 tolerances were maintained, as here just a little more metal is added to the non-working surfaces of the nut.

Where high strength is required, a hard, heat treated alloy-steel bolt may be used with a softer nut. Then, due to lesser strength of nut material, failure may occur in the nut at C-D. With such a condition, closer tolerances on the nut would add a small amount to the shear-ign area in proportion to the thickness of the black area and so improve strength slightly. Based on a Class 1 nut, this increase would amount to 2.3 per cent for Class 2 tolerances, and 3.9 per cent for Class 3 tolerances. Tnus, increase in shearing area is insignificant compared to large increase in cost of maintaining such tolerances.

Increased stripping strength of nut when required should be obtained by employing a stronger metal, heat treatment, or thicker nut.

In conclusion it will be realized that pitch diameter tolerance of nut as usually specified does not represent a variation of which the manufacturer can take full advantage. Available tolerance is reduced greatly by a series of unavoidable losses resulting from errors in taps and gages, truncation of the "no-go" gage, and by the practical necessity of not working too close to the tighter limits of the specifications. Thus, in establishing commercial tolerances for nuts, tolerances must be broad enough to encompass these losses and in addition must provide a reasonable allowance for tap wear and normal variations occurring even in good tapping practice. Nuts produced under such tolerances over a period of years have been satisfactory in service. Closer tolerances appear impractical, especially as they do not offer a commensurate increase in quality.

As a solution to this problem it has been suggested that American standard Class 1 tolerances be accepted as standard for nuts. Class 1 gages are available commercially and their use undoubtedly would eliminate much of the present technical difficulty between manufacturers and users of nuts. It is not sufficiently established as yet, however, that Class 1 tolerances can be met consistently by ordinary tapping processes. Possibly new and broader tolerance specifications for use with nuts only will be found necessary. German tolerances shown in Table 1 as well as other European systems of tolerance permit variations more consistent with good manufacturing practice than present American standards.

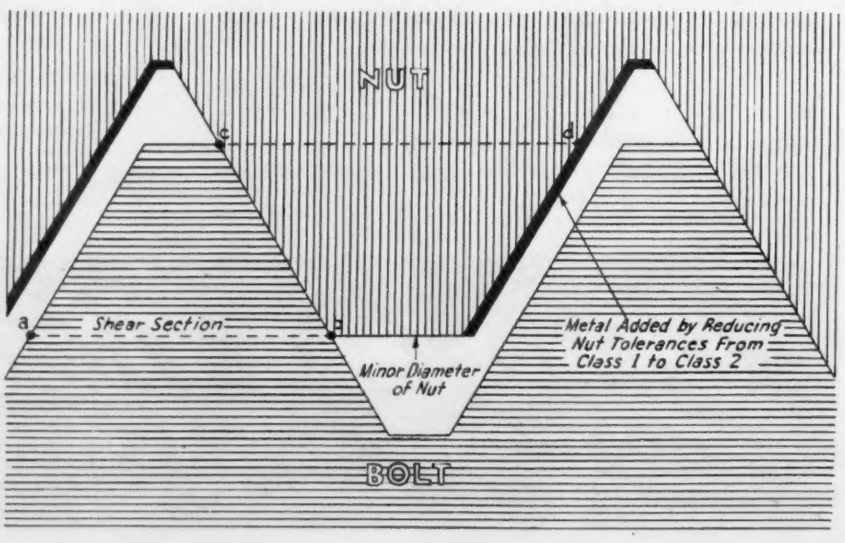


Fig. 4—Effect of nut thread tolerances on strength

Advice on Exhaust Systems, for Engineers

■ *Design of Industrial Exhaust Systems,* by John L. Alden; 220 pages; published by Industrial Press, New York; supplied by STEEL, Cleveland, for $3; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London S.W.1.

Purpose of this book, as stated by the author, is to tell the engineer how to design and build or how to buy an exhaust system that will perform adequately and economically the functions prescribed by the industrial hygiene expert or by the law. The work combines the theory of air flow to specific applications of exhaust systems in industry.

The text covers the following subjects: Flow of fluids, hood forms, air flow through hoods, pipe resistance, piping design, dust separators, low pressure conveyors, centrifugal exhaust fans, structural details and system planning, field measurements and their interpretation.

Forty-ton crane, equipped with G-E control, in a cold-strip mill in the South

"G-E d-c crane control makes crane operation reliable and accurate"

SAY TONNAGE-MINDED STEEL MEN

WHEREVER the patented G-E d-c dynamic-braking crane control has been put into service, we find the mill operators and engineers enthusiastic over the reliability and accuracy they are getting in crane operation.

A steel company in the South finds that its 30 cranes equipped with G-E control help in keeping tonnage up because the control meets the most exacting requirements in such diverse operations as roll changing, charging, stripping, and coil handling.

The electrical foreman in another plant points particularly to the handling of tin plate in the cold reduction department. A G-E equipped crane is used to lower stacks of tin plate into position for annealing. Its smooth, precise operation keeps the sheets in exact position so that the furnace hood can be closed over a stack without difficulty or delay, thus saving valuable time.

G-E d-c crane control is *low-maintenance* control. It's equipped with the famous G-E rocker-bearing contactors and magnetic time relays that have proved their stamina in all kinds of steel-mill control applications. It's *precision* control, also. A lowering circuit assures accurate jogging to a fraction of an inch.

Dependability, Accuracy, and Safety through these outstanding features of G-E d-c crane control

LOWERING

- Precise spotting of hook.
- Correct control of solenoid brake.
- Snappy motor response to master switch.
- Unsurpassed speed regulation.
- Time-limit acceleration.
- Automatic deceleration if desired.
- Wide range of lowering speeds, limited only by the inherent characteristics of the motor.

HOISTING

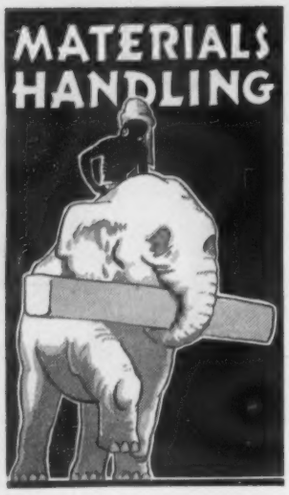
- Time-limit acceleration.
- Two creeping-speed points if desired.

PROTECTION AND SAFETY

- Maximum safety for operating crew.
- Dynamic-braking circuit provided when power fails.
- Motor and brake are protected from abuse.
- Motion of hook follows master switch if "plugged" in either direction.
- Can be furnished in a metal enclosure that will protect it against dirt and dust and thus greatly reduce maintenance.

We invite you to ask for complete information about the performance records of this crane control—records that are daily creating increased confidence in its ability to meet the varied and exacting demands of steel-mill service. Just get in touch with our nearest representative. General Electric, Schenectady, N. Y.

GENERAL ELECTRIC



Classifying

Power truck greatly facilitates warehouse operations, triples storage capacity in same floor space, cuts handling costs 50 per cent. Since handling is largest cost item here, these savings easily mean difference between a loss and a good profit

By DONALD C. LOTT
President
Tin Mill Products Corp.
Pittsburgh

■ RECENTLY use of a gasoline powered fork type lift truck at Tin Mill Products Corp., Pittsburgh, has been found a most efficient means of transferring steel sheet throughout unloading, classifying, storing and shipping operations.

Two general types of material are handled in this warehouse—tin mill black plate and tin plate. All material is between 20 and 34 gage, corresponding in thickness from 0.0375 to 0.0085 inch. This tin mill black plate is handled in wide variety of sizes and finishes including steamed blue, enameling stock, pickled dry, cold reduced, cold reduced and deoxidized, pickled annealed one-pass cold rolled, and others. This means that a large number of individual items or lots are made up, kept in storage and shipped. For instance, a recent listing of tin mill black plate stock included nearly 400 lots.

Result of this large number of items and numerous steps in handling is that handling operations themselves form possibly the most important element in determining whether a profit or loss is made on the warehouse operations. In addition to those items already mentioned, a large volume of tin plate also is handled and sorted in a similar manner.

Tin Mill Products Corp. does no processing of the steel sheets. Overruns of tin plate and tin mill black plate are received direct from the rolling mill on box cars on a railroad siding along the north end of the warehouse building. Here a car is spotted opposite the warehouse door and a floor plate laid connecting the warehouse floor with the car floor.

This then permits a Towmotor fork-type truck to enter the car and remove the packaged sheets. Material is packed in the box cars at the rolling mill in bundles individually wrapped in water-proof paper and steel strapped to wooden skids. About 35 to 40 tons of sheet are shipped per car. Of course the individual bundles are braced securely in the car to prevent movement during shipping.

Truck easily enters car and removes bundles as shown in Fig. 2 since overall width of truck at widest point is 41½ inches and overall length is 90 inches including 20-inch forks. The 95-inch turning radius permits sharp turns to be made in small space.

Packs Slid Endwise on Rollers

When large sheet packs, 72 inches long, arrive at the warehouse, they are removed from the box car by sliding them endwise on rollers from the car instead of using the truck. As car door is only 72 inches wide, it would be extremely difficult to remove them through the door lengthwise.

After being removed from the cars, the material is deposited in the sorting area shown in Fig. 3 where the steel bands are broken and each bundle is inspected carefully. At the right in Fig. 3 are shown the classifying tables where each individual sheet is gaged accurately for thickness, this determining in which pile the sheet is to be placed during the assorting operation.

After being classified as to thickness, sheets are placed in a stack with others of same length and

Fig. 1—Towmotor truck easily stacks bundles six or more high, greatly increasing storage capacity per square foot of floor area

Without Steel We'd Have To

GIVE AMERICA BACK TO THE INDIANS

EVER stop to realize how utterly your comfort, safety, life itself depend upon steel? When you eat, sleep, walk, ride, telephone or telegraph you are using steel.

Without steel there would be no newspaper, no radio; no heated homes, no modern office or factory buildings; no electric light, no gas, no oil. And as for national defense -- steel is the very bulwark of the nation.

Everything you use and enjoy depends directly or indirectly on steel. Because of improvements made in steel in recent years thousands of products are of better grade, and cost less -- and hundreds of new products are possible. The steel industry knows how important it is to employment and prosperity to maintain constant improvement in steel and manufacture. That is why Youngstown spends millions to improve its facilities and products and to help the public employ steel to better advantage.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels

General Offices - - - YOUNGSTOWN, OHIO

Sheets - Plates - Pipe and Tubular Products
Conduit - Tin Plates - Bar - Rods - Wire - Nails
Tie Plates and Spikes.

25--13B

YOUNGSTOWN

QUALITY V YOUNGSTOWN SERVICE

width. After being sorted in this manner, sheets are rebanded, wrapped in waterproof paper and steel strapped to wooden skids. The truck then places them in storage as shown in Fig. 1.

Tin plate is received from the rolling mills as "tin plate waste waste." This material comes in different sizes and thicknesses which are assorted by inspecting each sheet for thickness and placing it with other sheets of same size and thickness. These classifying operations involve building up a stock of the various sizes, so the large rack shown in background of Fig. 3 is used to accumulate quantities of various sizes. For instance, tin plate is classified into 18 different weights according to thickness, varying from 90-pound to 235-pound material, the thicknesses corresponding to 0.010 and 0.027-inch respectively. In addition to these various thickness classifications, sheet also is classified according to length and width.

Tin plate comes to the warehouse in boxes weighing about 200 pounds each. Ten of these boxes are wire strapped together on a skid so the bundle weighs about 2000 pounds, the average weight of bundles handled here.

Importance of efficient handling of this material is easily seen. Formerly a hydraulic hand truck was used to lift bundles during unloading, stocking, classifying and loading operations, but capacity was limited to about 2500 pounds, which meant that two small or medium size bundles were all that could be handled at one time.

Now the power truck easily unloads 35 to 40 tons of material from a freight car in a little over half an hour. In addition it permits stacking the bundles to a maximum height of 10 feet, yet the machine can easily enter a freight car because of its telescopic lift construction. Governed maximum speed is set at 6 miles per hour. Lifting capacity of the Towmotor is 5000 pounds at 18 inches from face of lifting carriage. The 4-cylinder gasoline engine develops 32 horsepower and consumes less than a gallon of gasoline per day when used at this plant. Of course it is not operated continually all day long.

Fig. 2—Truck loads and unloads material in box cars easily because of its extreme maneuverability

Since the power truck can stack to a height of 10 feet, this means bundles can be stacked six or more high as shown in Fig. 1. Thus, capacity of the warehouse is at least triple that when bundles could only be stacked two high. Also it stacks much faster than previous method, thus saving time in unloading cars and in loading outgoing shipments, as well as speeding up movement of material throughout the classifying operations.

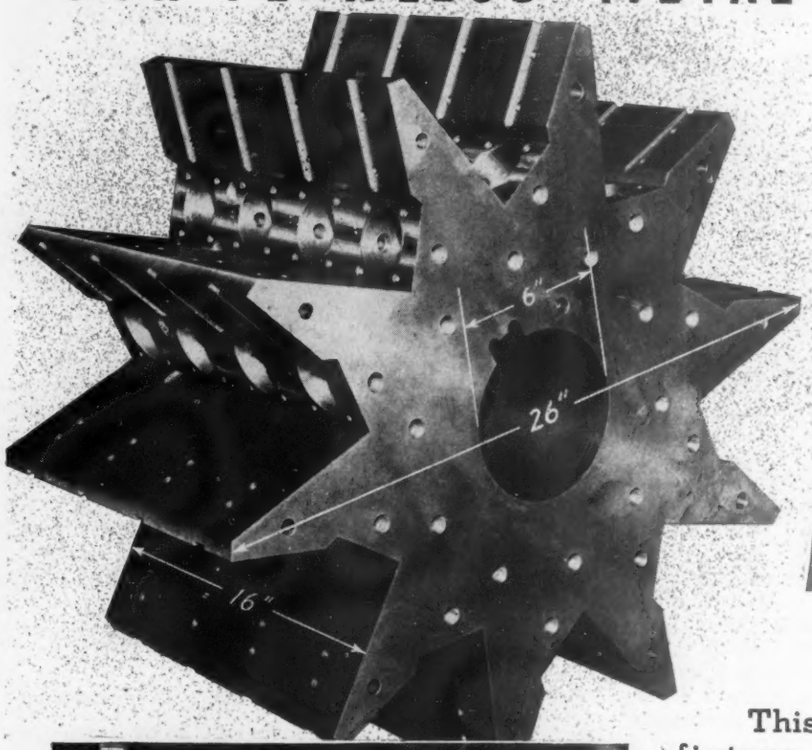
The warehouse is 50 feet wide and 118 feet long and has sufficient capacity to store 1500 tons of material. Material is shipped into the

(*Please turn to Page* 74)

Fig. 3. (Top)—classifying and gaging station at right with classifying racks in background. Fig. 4. (Center)—Towmotor runs right onto highway truck bed or deposits sheet packs on end of truck and pushes them to front of truck as shown in Fig. 5 at bottom

MEEHANITE

FOR *FLAWLESS* METAL STRUCTURE

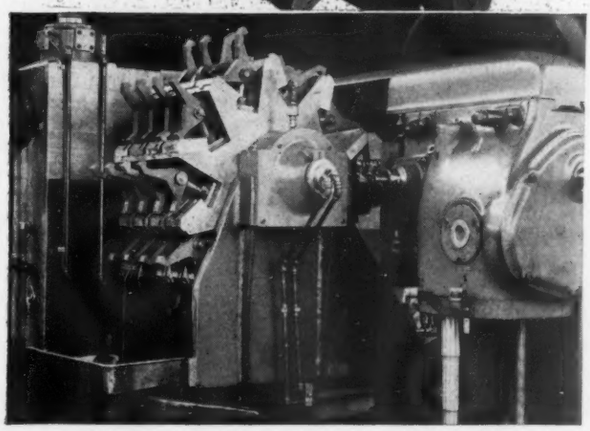


THE DEPENDABLE METAL • FOR IMPORTANT CASTINGS •

METAL

WRITE FOR ANY OF THESE 10 FREE BULLETINS

Castings Advancement · Casting Design
Dies · Wear Resisting · Oil Industry
Machinery Castings · Specifications
Engineer Investigates Meehanite
Structure Micrographs · Pump Castings

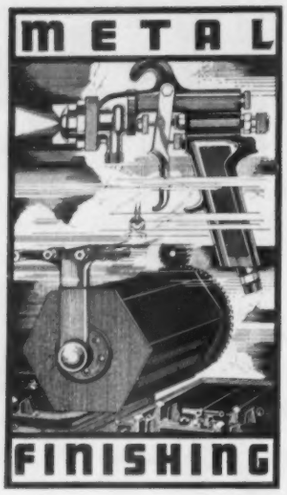


This intricate rotary drum type fixture for a Cincinnati Milling Machine Company's Special Profile Miller was cast in *Meehanite Metal* to insure a uniformly solid casting, free from shrinks and blow-holes and readily machinable. The unmachined casting weighed 1645 pounds, contained heavy sections up to 17 inches,—proved to be entirely flawless when subjected to the many machining operations necessary.

●BUY FROM THESE LICENSED MANUFACTURERS

Farrel-Birmingham Co., Inc.	Ansonia, Conn.	Kinney Iron Works	Los Angeles, Calif.
H. W. Butterworth & Sons Co.	Bethayres, Pa.	Koehring Company	Milwaukee, Wis.
Pohlman Foundry Co., Inc.	Buffalo, N. Y.	Cooper-Bessemer Corporation	Mt. Vernon, Ohio
Kanawha Manufacturing Co.	Charleston, W. Va.	Vulcan Foundry Company	Oakland, Calif.
Ross-Meehan Foundries	Chattanooga, Tenn.	E. Long, Ltd.	Orillia, Canada
Greenlee Foundry Company	Chicago, Ill.	Florence Pine Foundry & Machine Co. (R. D. Wood Company, Selling Agents)	Philadelphia, Pa.
Cincinnati Grinders Incorporated	Cincinnati, Ohio	Warren Foundry & Pipe Corp.	Phillipsburg, N. J.
The Cincinnati Milling Machine Co.	Cincinnati, Ohio	Rosedale Foundry & Machine Co.	Pittsburgh, Pa.
Fulton Foundry & Machine Co.	Cleveland, Ohio	American Laundry Machinery Co.	Rochester, N. Y.
The Stearns-Roger Mfg. Co.	Denver, Colo.	Banner Iron Works	St. Louis, Mo.
Atlas Foundry Co.	Detroit, Mich.	Valley Iron Works	St. Paul, Minn.
General Foundry & Mfg. Company	Flint, Mich.	The International Meehanite Metal Co., Ltd.	London, Eng.
Hamilton Foundry & Machine Co.	Hamilton, Ohio	Meehanite Metal Corporation	Pittsburgh, Pa.
Barnett Foundry & Machine Co.	Irvington, N. J.		

Australian Meehanite Metal Co., Ltd. ..... Waterloo, N. S. W.



Plating Aluminum

New process applies a tenacious coating on aluminum alloys, die castings and wrought or extruded metal to increase wear resistance, decorative effect, ease of soldering

By RAYMOND F. YATES
Krome-Alume Inc.
Lockport, N. Y.

■ IT HAS long been realized that a successful method of plating aluminum would greatly increase its use and bring about many applications heretofore denied. Plating for eye appeal alone is important in certain industries. In others, resistance to wear is the essential factor.

Also when aluminum is flashed or "struck" in a nickel bath for ten to fifteen minutes, it may be soldered with any of the commercially available solders and fluxes intended for other metals. Thus the advantages to be gained by plating are threefold.

Although there have been many previous attempts to plate this stubborn metal and a number of patents have been issued covering proposed processes, it was only recently that the Krome-Alume method was successfully introduced. Many installations are now being designed and it is estimated that before another year has passed 25 per cent of the aluminum used in certain industries will be plated either for increased wear, added decoration or ease of soldering.

Oxide Causes Peeling

Failure to plate aluminum previously is traceable not only to its highly electro-positive nature but also to the fact that aluminum oxidizes so freely and quickly that the surface of the virgin metal cannot be preserved long enough for immersion in a nickel bath. If plated with the oxide intact, the plating will peel even though the oxide skin may be little more than a millionth of an inch in thickness.

Naturally, all previous efforts to plate aluminum were directed toward removal of this film or skin. Thus it is somewhat of a paradox that the present process, instead of aiming at the removal of the film, builds it up to a thickness of perhaps 0.0005 inch, although plating over such a deposit of aluminum oxide would be entirely abortive.

This oxide surface is established in a bath of oxalic acid by the use of alternating current. The crux of the process lies in the subsequent partial removal of this anodic or oxide film with a simple chemical that tends to dissolve it away. The time required for this phase of the treatment depends entirely upon the alloy to be plated and varies from 38 seconds to 14 minutes.

After this treatment, the article is rinsed and is then ready for plating in standard nickel baths, either hot or cold, bright or gray.

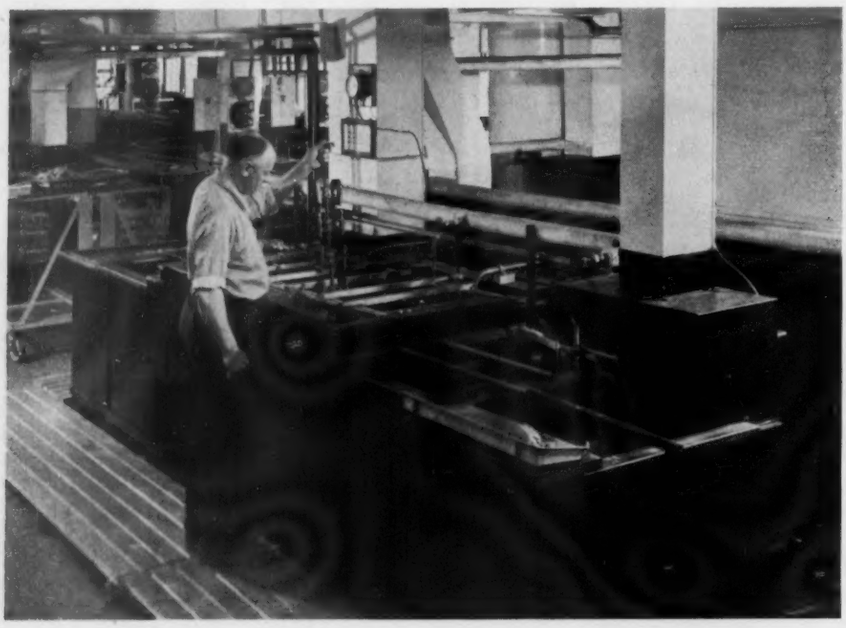
Nickel Plating Recommended

While metals other than nickel may be plated next to the aluminum, the inventor of the present process recommends nickel as the most suitable for reasons that will be justified by reference to the electro-chemical series and the various potentials involved. Then, over a thin coating of nickel, it is possible to place most of the other metals in common use.

Experience shows that aluminum may be prepared for plating at a cost of about $0.0025 per square foot and that it cannot only be plated far more successfully than either zinc or steel but at a cost that is as low if not slightly lower. Installation of the necessary equipment runs about $500.00 for a 15-kilowatt plant.

The anodizing is done with alternating current and the present plating process requires only two chemicals and from 11 to 20 minutes for preparation. With this process, no aluminum alloy lies beyond the reach of good plating. The adhesion shown is at times utterly uncanny

(*Please turn to Page* 75)



Setup at Eastman Kodak Co., Rochester, N. Y., where aluminum die-cast camera cases are electroplated using the method described here

Community Plate

Chest of Community Plate,
in Coronation design

A case of plating perfection... after cleaning with ORTHOSIL

IN COMMUNITY PLATE, made by Oneida Ltd., the silver plating must be as near perfection as skill and care can make it. It must be durable, for this ware may be passed down from one generation to the next. Above all, it must never peel.

Both the metal cleaning and the plating operations are performed in automatic machines. Oneida Ltd. has made a study of metal cleaners over a period of 25 years, and it is significant that after exhaustive tests Orthosil was selected for electrolytic cleaning. The results are an unusually thorough cleaning which permits perfect adhesion, and an appreciable saving in cost. In addition, because Orthosil is a basic alkali, no chemical mixture is required.

Even though your own cleaning operations may not require a similar perfection of finish, you will find that Orthosil offers many advantages. It is widely used as a cleaner in heavy industry, for ferrous metals and brass. Being water-free and containing no weak ingredients, it provides outstandingly quick action. Especially effective in electrolytic cleaning because of its high conductivity. Cuts through coatings of grease and oil—prevents dirt from re-depositing—leaves the metal clean and ready for further processing. It is dry, highly concentrated, economical.

Why not let Orthosil start cutting costs for you?

Pennsylvania Salt Manufacturing Co., Widener Bldg., Phila., Pa. — New York · Chicago · St. Louis · Pittsburgh · Tacoma · Wyandotte

PENNSYLVANIA SALT
MANUFACTURING COMPANY
Chemicals

ADD THIS EXTRA SALESMAN

– without a

UNITED STATES

TO YOUR STAFF

Cent of Cost!

Wherever your goods are offered he will always be on the job helping to increase your sales — adding additional prestige to your product.

IF your product includes an important use of steel, whether the steel be visible to the buyer, hidden under a coat of paint or porcelain enamel, or buried within the product itself as in upholstered goods, we offer a plus selling advantage—a salesman whose power is growing at a rate exceeding even our own optimism . . . the U·S·S symbol.

This seal, which you can affix right beside your own, says to the customer in effect, "In this product we are giving you the best steel money can buy." Think what any salesman can do with such support.

All our skill, our research and facilities, are devoted to making the U·S·S symbol the most powerful of selling aids. It stands for the highest type of metallurgical service, the best in steel quality. Where is there a trade-mark more universally recognized among industrial steel consumers?

Now we have taken another step. Through leading national magazines we are acquainting the public with the importance of a trade-marked steel and by this move have forged a new sales aid for our customers.

Millions of articles now carry the U·S·S trade-mark. Millions more will carry it. Why not investigate its sales advantages to you? Write today to any of the following companies for full information.

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
CARNEGIE-ILLINOIS STEEL CORPORATION
Pittsburgh and Chicago
COLUMBIA STEEL COMPANY
San Francisco
TENNESSEE COAL, IRON & RAILROAD COMPANY
Birmingham

United States Steel Products Company, New York, *Export Distributors*

THESE SEALS NOW AVAILABLE

U·S·S STEELS

A seal for use on any product where the steels used are trade-marked U·S·S. This mark applies to the general group of steels rather than specific alloys.

U·S·S COR-TEN

This metal seal for the famous low alloy, high-strength, corrosion-resisting steel so largely employed in equipment where its use reduces weight, increases capacity.

U·S·S STAINLESS

Identifies any article on which it appears as being made of the finest stainless steel.

U·S·S VITRENAMEL

Enamelists who are as proud of the steel they use as of their enameling employ this mark as proof of the care they take.

U·S·S COPPER STEEL

A seal which says in effect: This article is made of a steel which insures long life under trying corrosion conditions.

U·S·S PREMIER SPRING WIRE

On Bed-springs, Innerspring Mattresses and Upholstered Furniture — the customer's assurance that the finest spring wire obtainable has been used.

PARTIAL LIST OF PRODUCTS WHICH NOW CARRY U·S·S TRADE-MARK

FABRICATED FROM U·S·S COPPER-STEEL (GALV.)

Buckets · Tubs · Caskets · Burial Vaults · Heating Pipes · Stove Pipe

FABRICATED FROM U·S·S VITRENAMEL SHEETS PORCELAIN ENAMELED

Bath tubs · Sinks · Stoves · Washers · Ironers · Table tops · Refrigerators · Show cases · Wall paneling · Kitchen ware · Cabinets

FABRICATED FROM U·S·S STAINLESS STEEL

Kitchen ware · Coffee urns · Bar equipment · Containers · Hotel equipment · Plumbing fittings · Restaurant equipment · Architectural trim

FABRICATED FROM U·S·S PLAIN STEELS

Buckets · Tubs · Trays · Lockers · Cupboards · Tin ware · Garden tools · Cabinets · Stoves · Heaters · Paper-hanging tools · Refrigerators · Fire arms · Truck bodies · Panels · Partitions · Doors · Office desks · Furniture · Pressed metal plumbing

FABRICATED FROM U·S·S PREMIER WIRE

Upholstered furniture · Mattresses · Box springs · Auto upholstery

STEEL

Carbon Aids Welding

Use of carbon rods, plates and paste proves valuable in controlling flow of molten metal. Also saves weld metal and welding current, reducing work required in finishing

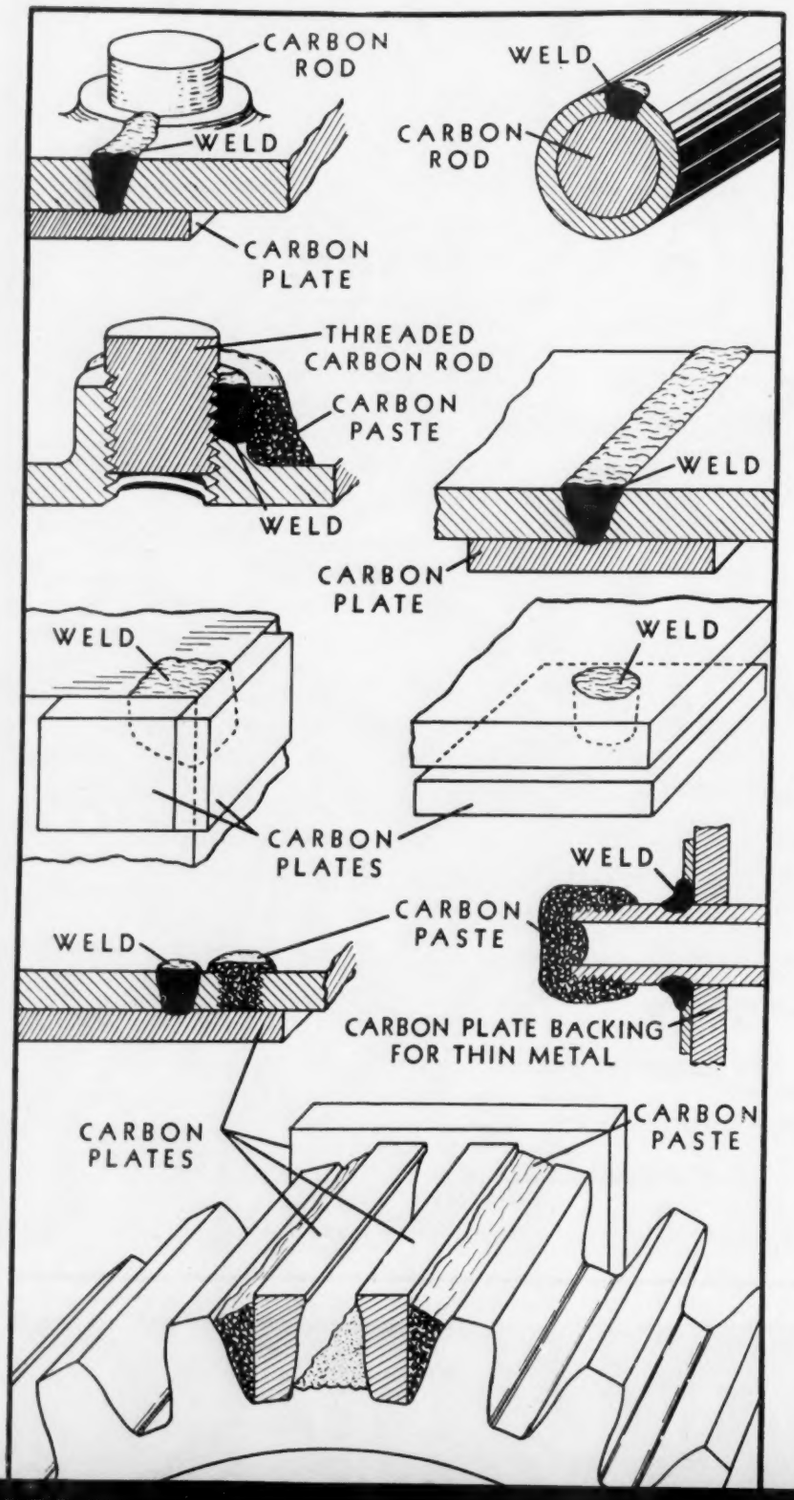
■ WIDESPREAD use of fusion and bronze welding to repair and build up worn surfaces has emphasized the need for controlling the flow of molten metal during such operations. It is desirable to restrict the flow of metal for two reasons: First, by restricting application of metal, grinding and finishing operations are reduced, thus cutting cost of handling the job. Second, the cost is reduced still further by making it necessary to melt only that amount of metal required to give the desired outline or shape of part being repaired. This means lower material cuts, less welding current consumed and a saving in operator's time as well.

To permit these savings to be realized, carbon rods, plates and paste are available. These materials can be used for molds, cores and dams to restrict the flow of molten metal and also to protect adjacent parts against excessive heating.

Carbon Used Again

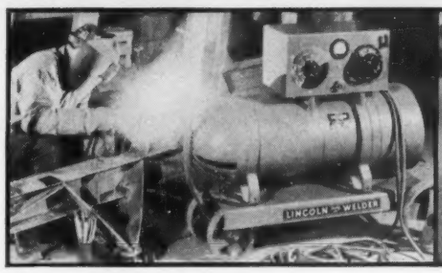
Quite frequently it will be found advantageous to protect adjacent areas with carbon plates or paste against the welding heat. For this use, carbon materials appear better than metal shields since weld solder or metal will not adhere tightly to the carbon material. Also, it is removed easily. After this the fact that the carbon material is not damaged by use makes it very economical as well. The carbon material can be used over again with good results.

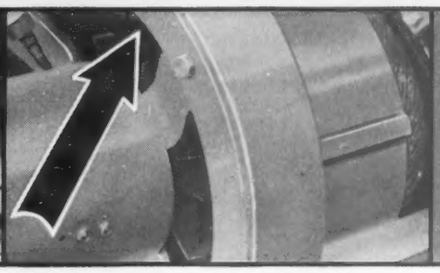
Accompanying diagrams show a few ways in which carbon rods, plates and paste can be used to advantage in welding operations. One

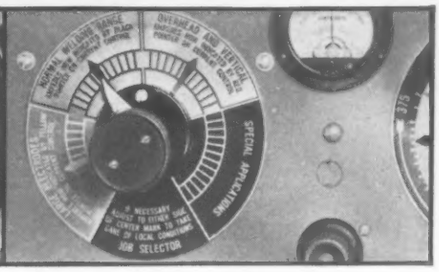


Suggested applications of carbon rods, plates and paste in various types of welding and repair work. Drawing courtesy National Carbon Co. Inc., Cleveland

WHAT DO YOU KNOW *about arc welding machines?*



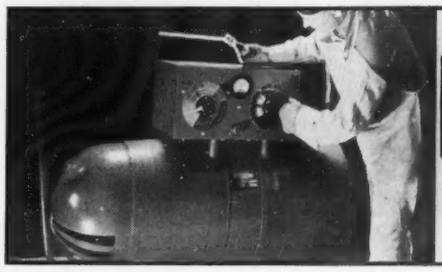


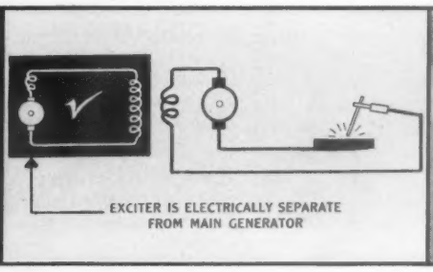


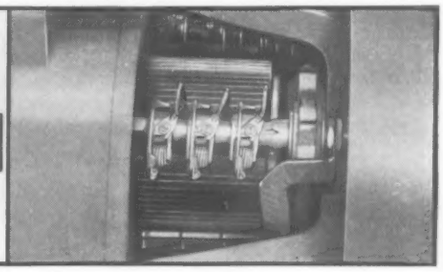
1. How can large electrodes be used for faster welding without danger of burnout? Answer: By using a *"Shield-Arc."* Its motor provides positive and complete protection from burnout, making possible sustained operation at high average loads.

2. What is the full meaning of *"Shield-Arc's"* Self-Protection? It prevents burnout *from any cause*...sustained overload, single-phase running, high or low line-voltage, phase unbalance or impaired ventilation...avoiding delays and expense.

3. How can the TYPE of welding arc be varied to suit various joints and working conditions for maximum speed and quality on *every* job? Answer: With a volt-ampere-slope control. Only *"Shield-Arc"* has this "Job Selector."



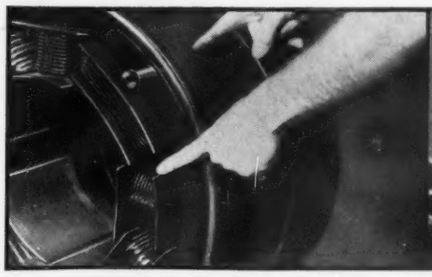


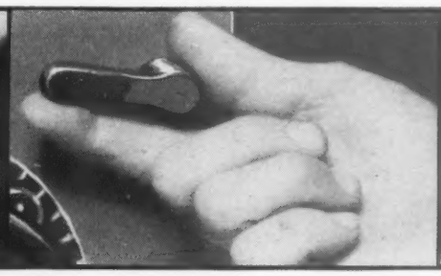


4. What welder provides *continuous* selection of both the TYPE of arc and the AMPERAGE with all settings marked right on the control dials? Answer: *"Shield-Arc."* This simplifies "setting" and minimizes welding cost.

5. How does Lincoln Separate Excitation improve welding? Answer: It acts like an electrical flywheel, providing constant power for a steady arc under all welding conditions, assuring easier welding and quality results.

6. How can you assure long life for brushes and commutator? Answer: Buy a *"Shield-Arc"* and eliminate the need for brush-shifting. The brushes are fixed at the factory for *permanent* sparkless operation. They seldom require attention.





7. What advantage has *"Shield-Arc's"* Laminated Magnetic Circuit over solid iron? Answer: It quickens the generator's response to changing conditions at the arc. Assures faster welding and less spatter under all conditions.

8. What two types of polarity switches are used on welders? Answer: One type is in the welding circuit. The other (*"Shield-Arc's"*) is in the excitation circuit —it carries no heavy current to burn contacts and can be used as a disconnect.

9. Why can thin-gauge material be welded so effectively and economically with a *"Shield-Arc"* Welder? Answer: Because its Dual Continuous Control makes available extremely low current values without need for wasteful resistances.

For further details, consult the nearest Lincoln office or mail the coupon

Largest Manufacturers of Arc Welding Equipment in the World

THE LINCOLN ELECTRIC COMPANY

CLEVELAND, OHIO

THE LINCOLN ELECTRIC CO., Dept. Y-613, Cleveland, O.

Send further explanation of [1] [2] [3] [4] [5] [6] [7] [8] [9]. Send free bulletin on *"Shield-Arc"* Welder.

Name _____ Position _____

Company _____

Address _____

City _____ State _____

company recommends use of their welding carbon rods as cores and fillers to save drilling holes that otherwise might be filled with metal during the welding process. Tapped holes may be given added protection by threading the carbon rod to fit. Such rods are available in sizes up to 3 inches in diameter and in 12 to 14 inch lengths, and no doubt other sizes are obtainable.

Carbon plates are used as backing up material when welding thin plates or sections. When building up missing or broken parts with the electric arc or oxyacetylene torch, carbon plates may be used as a dam to prevent molten metal from flowing beyond the immediate field of operation. Such carbon plates are particularly useful in making forms when building up broken parts, such as broken teeth on gears or pinions. Placed underneath a weld, carbon plates preserve a smooth surface and remove the need for subsequent machining or chipping.

To indicate the wide range of plate sizes available for such work, the accompanying table is given. It will be noted that material is available from ⅛-inch to 2 inches in thickness and from 6 x 12 inches up to 15 x 18 inches in size.

Such plates can be cut easily with a hacksaw to any desired shape. Also they can be shaped into practically any form with a file or an abrasive wheel. While they are mechanically strong and highly refractory, they do not shrink when heated during welding and do not burn, chip or break easily. Under normal conditions they can be used repeatedly.

Carbon Also in Paste Form

At some time or other, every welder has felt the need for a fire and heat resisting compound which could be molded easily into any desired shape or which could be used to fill various depressions or openings to keep the molten metal out. A suitable carbon paste has been developed to meet these requirements.

When building up the metal around threaded or irregularly shaped holes, or where it is necessary to use the arc or torch between or near machined surfaces, such a carbon paste may be used as a protective covering to save much time and subsequent machining. It also aids in producing a neater appearing job. It is an excellent medium for protecting gear teeth and other finished surfaces adjacent to the welded section.

Thin aluminum sections or light parts can be backed up with carbon paste to prevent collapse of the metal when heated. For lining broken sections, either large or small, the usual shimming process can be dispensed with and much time saved by using carbon paste as a work cushion while the parts are being placed in position. The material also will hold the parts in the correct position during the subsequent welding operation.

While these are some of the more common applications of carbon materials in welding operations, there are undoubtedly many others where such materials can be used to considerable advantage.

Prevents Weld Corrosion

■ To prevent corrosion at overlap and adhesion of weld spatter on metal to be lap welded, Glyptal 1294 gray, a pigmented version of Glyptal 1294 clear, has been announced by General Electric Co., Schenectady, N. Y. Work brushed or sprayed with it can be left exposed to the atmosphere until fabrication is complete with the assurance that edges will not need cleaning before final welding. Shipbuilders and pipe and tank manufacturers are expected to find it useful.

Low-Carbon Welding Rod

■ To assure arc stability and easy restriking of arc with small low-voltage transformer welders in general welding and repair work on light gage sheet steel, Lincoln Electric Co., 12818 Coit road, Cleveland, has developed Readyweld, a low-carbon steel rod with a heavy extruded shielded arc coating and weld metal possessing high strength and ductility. Primarily for use with alternating current transformer welders of low open-circuit voltage, it also operates with direct current negative plants. Rods are manufactured in 3/32-inch diameter, 12-inch length and are packed in 25-pound containers.

Large Ladles Are All-Welded

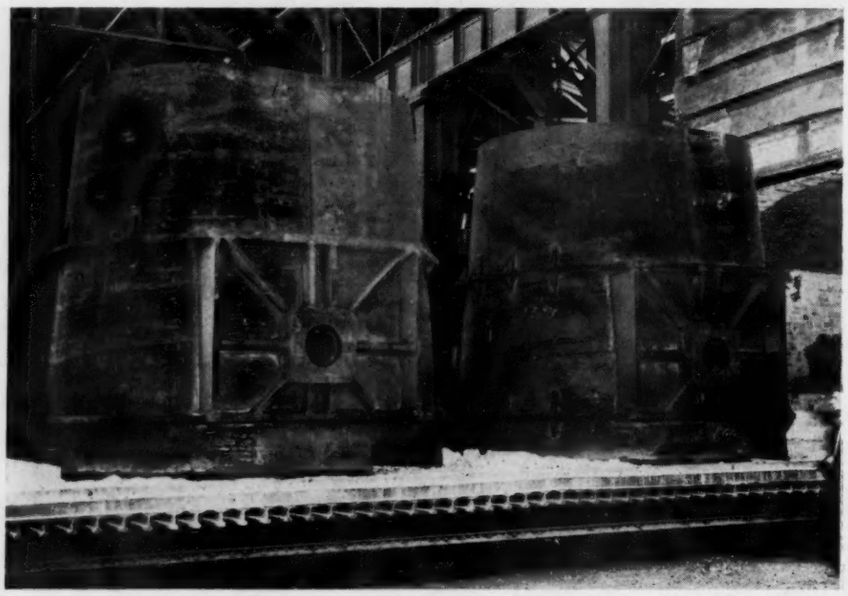
■ SHOWN IN the accompanying illustration are two of a series of nine 120-ton ladles recently completed for use in plants of Bethlehem Steel Co. The first 120-ton welded ladle was placed in service a few years ago with a total of 15 such ladles now in use in various Bethlehem plants.

Improvements in open hearth practice necessitated increasing ladle capacity. The lifting capacity of hooks and crane equipment was limited. If conventional ladle design had been used, the weight of the larger ladles necessary to handle the larger capacity, including the stopper rigging, would have increased from 54,000 to 65,000 pounds. This increase in weight plus the additional 120 tons of hot metal to be handled would have required expensive changes in lifting equipment and building structure.

However, by substituting all-welded steel ladles, each weighing only 38,000 pounds, it was found that no change was necessary in hooks or cranes and the substitution of 120-ton ladles could thus be made gradually as the smaller ladles became unfit for service.

The new ladles are carefully welded by qualified welders from high quality steel plate and forged steel trunnions. They are completely stress relieved after welding. Principal dimensions are: Major axis, top 12½ feet, bottom 10 feet 5 inches; minor axis, top 10 feet 7 inches, bottom 8½ feet; outside trunnion, 13 feet 9 inches; height 11 feet.

These 120-ton capacity welded ladles enabled use of larger ladles with present crane equipment.



LESS COST PER TON OF STEEL ROLLED

TIE PLATE ROLLS MADE FOR CIA F UNDIDORA DE FIERRO Y ACERO DE MONTERREY, S. A.

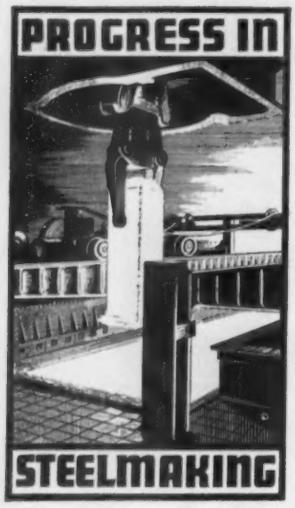
Not "Jacks-of-all-trades" but *Masters* of one are the makers of the world-famed Phoenix Rolls. That's why Phoenix Rolls serve better and longer, cut mill costs to the minimum.

PHOENIX ROLLS CUT COSTS, INCREASE PRODUCTION IN

STRIP MILLS
BLOOMING MILLS
SLABBING MILLS
PLATE MILLS
RAIL MILLS
SHEET & TIN MILLS
ROD MILLS
STRUCTURAL MILLS
SKELP MILLS
MERCHANT BAR AND BILLET MILLS
PIPE & TUBE MILLS
NON FERROUS MILLS

PHOENIX ROLLS

PITTSBURGH ROLLS DIVISION of BLAW-KNOX CO.—*"Steel's Partner"*
Pittsburgh, Pa.



Enlarges Cold Mill

New facilities include 4-high roughing mill and 2-high finishing mill, both handling sheet up to 30 inches in width. New continuous pickler unit features individually driven reel drums which greatly increase flexibility of pickling operations

■ RECENTLY Superior Steel Corp., Pittsburgh, completed installation of new equipment, rearrangement of buildings and facilities to increase maximum capacity of cold mill from width of 20 inches up to a maximum of 30 inches. One of the primary purposes in the modernization program was to provide wider capacity to handle stainless steel strip which each year constitutes an increasingly larger portion of the output of this plant.

New cold mill building is 80 x 260 feet. A 20-ton crane operates across the full width and down the full length of this area. Referring to the layout diagram Fig. 1, the new cold mill building will be seen near the center of this diagram. Material comes from the hot mill at the extreme left. It may be stored either in an outdoor storage area under crane-ways as indicated or may pass into the storage and pickling building which immediately adjoins the cold mill building. After pickling and cleaning, strip may go to the new cold mill.

Annealing Department Enlarged

The new annealing department immediately east of the new cold mill now contains five circular annealing covers each with three bases for annealing coils under controlled atmosphere conditions. New annealing department was described in detail in STEEL, March 20, page 52. After annealing, material may go to the rolling mill building just north of the annealing department where additional rolling operations are performed. From here the coils pass to the shipping department for shipping. Thus path of material through the plant roughly follows a U with an elongated leg at the left portion. Of course, various types of special material require some departure from this outline, but in general, flow of material through the plant is as outlined.

Movement of material between the various buildings and departments is facilitated by use of a narrow-gage railway system. Some 300 cars are employed to move material on this system and ten engines furnish the motive power. Engines are of the electric type fed from an overhead trolley wire. By applying an efficiently laid out system of tracks and dispatching, movement of materials through the plant takes place in an orderly manner.

Storage areas at various positions permit continuous operation of the departments. For instance, a storage area is provided near the continuous pickler, in the cold mill building, in the annealing department and in the supplementary rolling-mill department. In addition, a large storage area is provided between the hot mill and the cold mill under a craneway covering an area about 75 feet wide and 200 feet long.

The new continuous pickler unit has a number of unique features. The pickle tank itself is 115 feet long and is of concrete and brick construction.

A new departure in coiling equipment is seen in Figs. 2 and 3 showing individual coiler units to coil strip coming from the pickler. Instead of the usual single drive simultaneously coiling the series of strips passing through the tank, this pickler employs six individual coiler units. The complete unit is capable of handling strips from 2 to 30 inches in width at speeds from 15 to 60 feet per minute.

Maximum total width of material passing through the tank is 60 inches. This means that two 30-inch strips, three 20-inch strips, four 15-inch strips or six 2 to 9-inch strips can be handled simultaneously.

The main advantage of this arrangement is that it affords a much

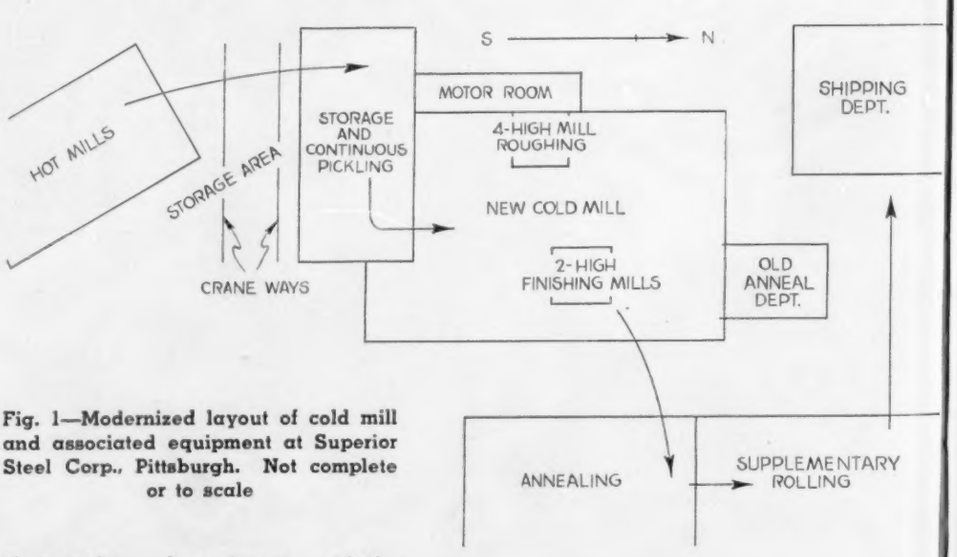


Fig. 1—Modernized layout of cold mill and associated equipment at Superior Steel Corp., Pittsburgh. Not complete or to scale

Mike is *some* watchman! Mike never needs a cup of coffee, has no curiosity; never gossips, never gets drowsy, never asks for a relief, never ducks for a smoke, never moves without authority.

Mike *really watches* heating operations in annealing, protective atmospheres and tin plate manufacture . . . and watches the gas bills, too! Mike is the micrometer adjusting wheel that controls the valve action of the Kemp Industrial Carburetor, which in turn provides 100 percent premixing of gas and air, allowing accurate control of flame pressure and flame characteristics, allowing flame application in enclosed chambers, *even in solutions* . . . with material savings in fuel. Like to hear more? Address **The C. M. Kemp Mfg. Co., 405 E. Oliver St., Baltimore, Md., or Oliver Bldg., Pittsburgh, Pa.**

KEMP of BALTIMORE

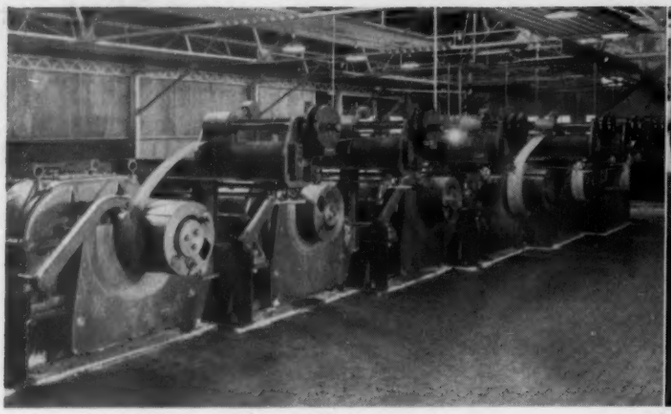


Fig. 2—Slow-speed end of coil-winding equipment, showing drums mounted directly on gearmotor shafts. Photo courtesy Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Fig. 3—Gearmotor side of reels. This battery contains two 7½-horsepower, two 10-horsepower and two 15-horsepower units. Capacities are 2000, 4000 and 6000-pound coils respectively. Drums are 20 inches in diameter. Photo courtesy Westinghouse Electric & Mfg. Co.

more flexible setup since speed of any strip is not dependent upon speed of other strips. This means that different materials can be pickled simultaneously even though one material may require a slower speed than another since each of the coiler units is individually driven by its own motor and gear reduction which can be set to maintain any speed desired. Thus it is possible to handle different steels at different speeds simultaneously in the pickler.

Each of the six coiler units has its own rheostat rider arm riding on the coil so as the coil increases in diameter, speed of motor decreases automatically to maintain a constant strip speed through the pickler.

Speed of each individual coiler unit is adjusted by a rheostat mounted on the frame next to start-and-stop buttons and readily accessible from the operating side shown in Fig. 2. Of the four coiler units shown in this view, the one at extreme left and one at extreme right are in operation. The use of individual coiler units also permits more continuous operation of the pickler since it is not necessary to stop other strips when starting or removing a strip. This also simplifies threading operations through the pickler and permits maintaining maximum production from the unit. In addition, it allows one or two operators to handle the entire loading and unloading operations connected with starting and removing the coils at the coiler end since all the other units may be in operation while the operator is removing coils from any one of the units. This means that unloading operations can be staggered and so permits more efficient utilization of the operator's time.

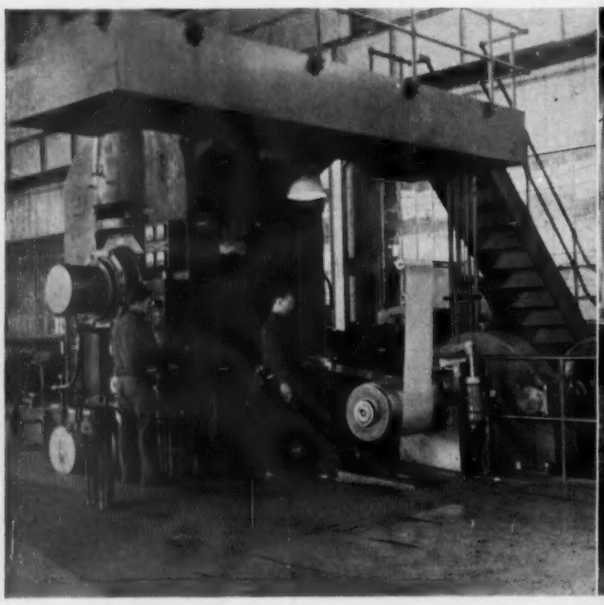
Fig. 3 shows opposite side of the coiler units. Here can be seen the individual motors with their integral gear-reduction units. Gear reduction is such that coiling speeds are possible throughout a range of strip speeds from 15 to 60 feet per minute.

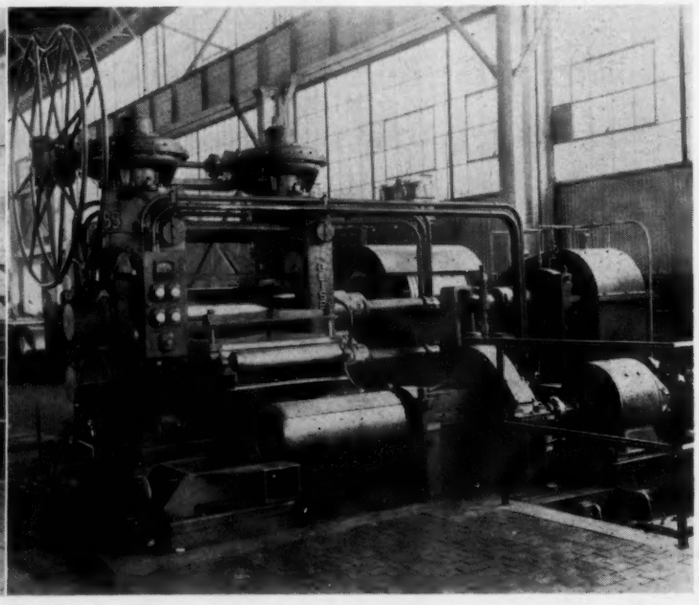
In the new cold-mill room will be found a new 4-high mill of the most modern type. This unit is used for roughing operations and has a maximum strip speed of 600 feet per minute. It is driven by a 1000-horsepower direct-current motor located in the adjoining motor room.

This roughing mill is used principally in rolling stainless steel. It handles strips up to 30 inches in width. Larger proportion of the steel handled is in coils of material up to 0.125-inch in thickness. Fig.

Fig. 4—This new 4-high mill here is working stainless steel and winding paper in the coil to protect the finish

Fig. 5—Here is the new 2-high cold mill. A 200-horsepower motor drives it at strip speeds up to 600 feet per minute





ADVERTISING PAGES REMOVED

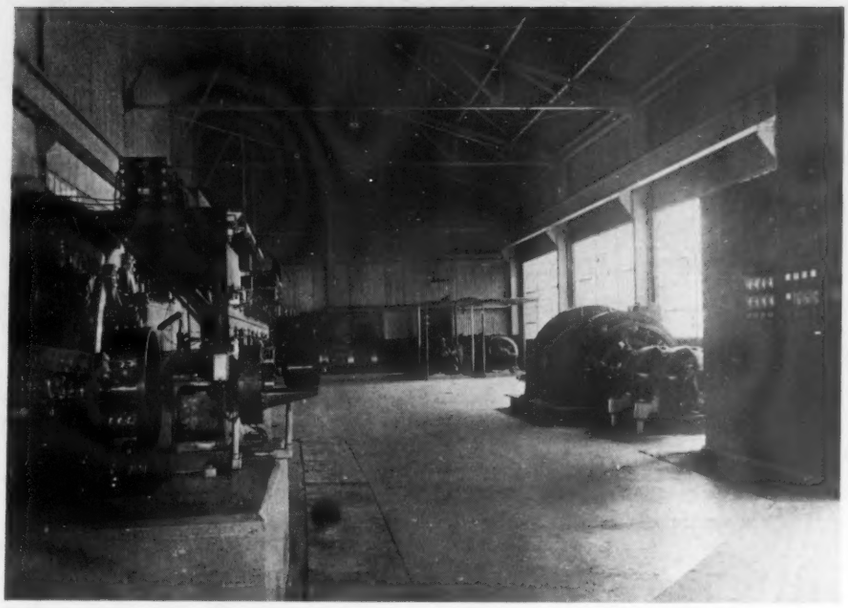


Fig. 6—Motor room with 1000-horsepower motor at left, high voltage equipment at right

4 shows a view of the recoiling side of this mill. Here stainless steel is being worked and a paper filler is being wound into the coil to protect the highly finished surface of the material.

The new 2-high finishing mill is shown in Fig. 5. This also handles strip and sheet up to 30 inches in width. It is used to finish material up to a maximum thickness of 0.125-inch. A 200-horsepower direct-current motor at speeds of from 400 to 1200 revolutions per minute is used to drive this mill. Speed of strip can be varied up to a maximum of 600 feet per minute.

Also located in the main cold-mill room is a recoiler unit which handles material up to 30 inches in width and there is a cutting up line with a side trim shear leveller and cutting-up shear also a slitter. Other smaller units are located in this room.

Motor room is 35 feet wide and 120 feet long. It is immediately adjacent to the main cold-mill room. Fig. 6 shows at left the motor driving the 4-high roughing mill in Fig. 4. The motor is located in the adjoining motor room with the drive extending into the mill room. This motor is rated 1000 horsepower at from 250 to 750 revolutions per minute.

At the extreme right in Fig. 6 can be seen the high-voltage panels and steel-encased switch gear housing the high-voltage equipment. Just to the left of this control panel can be seen the large motor-generator set used to furnish the variable-voltage direct current supplied to the large cold mills. This motor-generator set is driven by a 1500-horsepower synchronous motor at 720 revolutions per minute. The main direct-current generator is rated 600 volts at 1667 amperes. There are two other auxiliary direct-current generators in this set.

At the far end of the motor room in this view part of the motor-generator and control used with the six coiler units of the pickling line is visible. Each of the six motors driving coilers receives current from an individual generator at variable voltage. All six of these generators are connected together and driven by one motor.

•

Electric tailstock gage with power unit mounted on measuring machine. View shows gage block between headstock and tailstock spindles

Millionths of an Inch in Gage Room

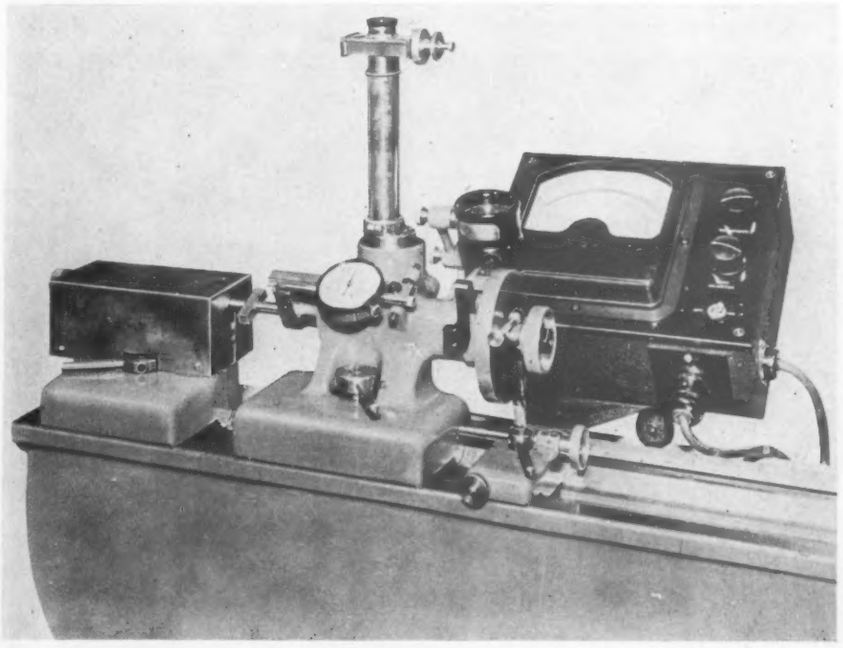
■ DIFFERENCES as small as a millionth of an inch can be compared electrically through the recent application of an electric gage head to the tailstock of a Pratt & Whitney measuring machine in the tool and gage department of General Electric Co., Schenectady, N. Y.

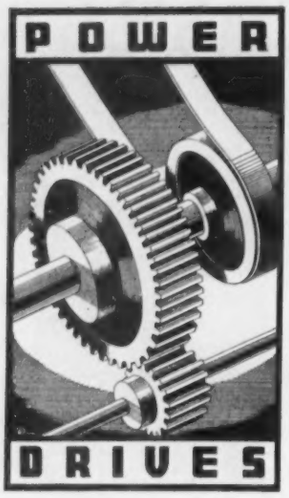
Essentially this machine consists of a heavy bed plate with a movable headstock toward the right end and at the left a movable tailstock equipped with an electric gage. Differences in length over 0.00001-inch are measured mechanically at the headstock, but finer differences are measured by combination of the tailstock and electric gage.

Parallel to the V-flat ways of the machine is an 80-inch bar in which is inserted a steel measuring button at each inch. On the polished surface of each button is a finely scribed line, precisely located with reference to the line on the zero button at the left end.

Mounted on the headstock is a microscope with two parallel hairlines for use in positioning the headstock with reference to a given line on the bar. A micrometer screw adjusts the headstock spindle and makes possible vernier readings to 0.00001-inch.

Head of the electric gage is mounted on the tailstock in such a way that gage spindle is also the tailstock spindle. This arrangement makes the gage-head spindle responsive to slightest variations in gaging pressure.





Punch Press Drives

Variable speed transmissions quickly repay their cost by higher operating speeds and increased production they make possible. Also permit adjustments to be made easily when setting up dies since press speed can be reduced to 1/8 full speed

■ SPEED NUT division of Tinnerman Stove & Range Co., Cleveland, with a capacity of some 200,000,000 Speed nuts annually, uses various sizes and types of punch presses in stamping and forming operations involved in production of these prices from strip steel stock.

Speed nuts are manufactured in more than 300 different shapes and sizes for many different applications. Manufacturing operations range from simple stamping and upsetting on a small punch press to large 4-slide machines handling the more complicated punching and forming operations. These machines can roll up a complete circle when set up for such a sequence of operation. The small punch presses operate at extremely high speed. Details of Speed nut manufacture, material from which they are made, size range, etc., were presented in a previous article, (see STEEL for March 28, 1938, p. 46).

A number of drives to these punch presses were fitted with Reeves variable-speed transmission units. Object was to adjust speed of the press according to size of the strip stock being handled and amount of work being done on the strip. Extreme accuracy is most essential in forming Speed nuts. There must be no burrs on the raised points or other parts of the Speed nut.

Study Press at Slow Motion

Variable speed drives also were found to aid in setting up dies as the units employed permit a speed variation of about 8 to 1. Thus press speed can be slowed down when setting up a die so the action can be seen clearly and studied carefully. This makes it infinitely easier to take out "bugs" in operation of the dies and so greatly facilitates setting up the dies.

As seen in Fig. 1, most of the presses include a roller leveler arrangement to straighten the strip stock before it enters the press. This unit is shown here at the extreme left. Next in line is the knuckle type, positive, reciprocating feed which advances the strip into the dies at each stroke of the press. Since these dies in most cases are of the progressive type, where from two to eight stages may be used to handle the various slitting, punching, forming, upsetting and shearing operations, it is extremely important that the reciprocating slide feed mechanism operate with great accuracy. This means in setting up the operations that the ability to operate a press at extremely slow speeds is of great value in making the necessary adjustments and preventing breakage of dies during preliminary operations. Then as the die action is adjusted more accurately, the speed of operation is stepped up gradually until maximum is reached.

Air Aids Removing Work

In most instances the factor largely limiting speed of operation is the ability to remove work from the dies to prevent jamming. As an aid in preventing jamming, an air blast is used on almost all the presses to clear completed work from the dies. The air blast does not run continuously but is synchronized with the press.

Operation of the dies also was improved by inclining the presses

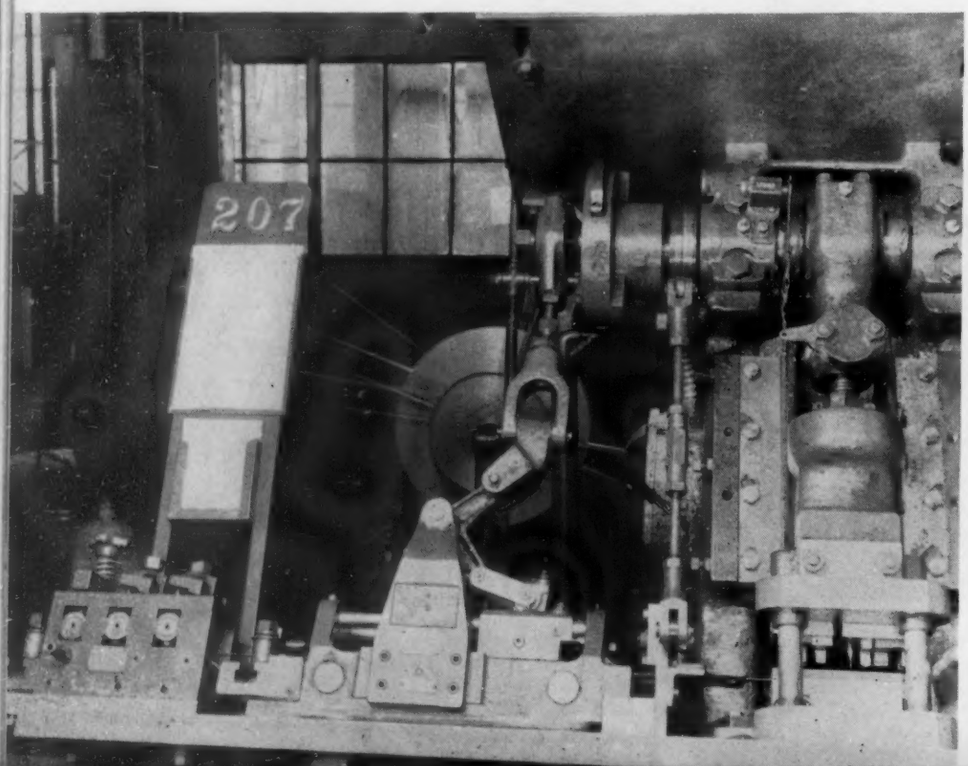


Fig. 1—Typical setup with roller leveler, reciprocating slide feed, automatic strip clamp and progressive dies—all in line from left to right with strip traveling from coil at left

How Zirconium helps make sound 12 to 14% Chromium Steels

ZIRCONIUM is being successfully used as a final deoxidizer in 12 to 14 per cent chromium steels. This treatment thoroughly cleanses the steel, helps remove dissolved gases, and eliminates pinholes and porosity in ingots and castings. A sound, dense steel results. The form of zirconium most effective for this purpose is 35 to 40 per cent zirconium alloy.

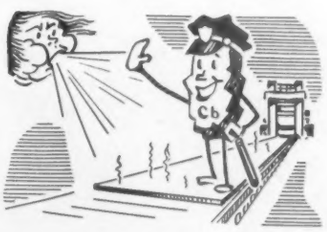
Ask to have one of our metallurgists call and explain further how you can improve your 12 to 14 per cent chromium steels with zirconium. He will gladly help make your use of this and other "Electromet" ferro-alloys profitable, without obligation. Electro Metallurgical Company, Unit of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York, N. Y. In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario.

Items of Interest about other "Electromet" Ferro-Alloys

High-Nitrogen Ferrochrome Improves High-Chromium Steel Castings — High-nitrogen ferrochrome adds both nitrogen and chromium to steel. A small per cent of nitrogen in cast steels containing over 20 per cent chromium greatly refines grain size, inhibits objectionable grain growth at high temperatures, materially increases strength and toughness and effects a slight increase in hardness.

Calcium-Manganese-Silicon Eliminates Pinholes — In repeated tests, calcium-manganese-silicon used as a ladle deoxidizer has proved beneficial for counteracting gases which penetrate the steel when it is being cast. The elimination of these gases reduces the formation of pinholes in the castings.

Use Columbium to Counteract Air-Hardening in Plain Chromium Steels — Columbium in small amounts in wrought plain high-chromium steels counteracts air-hardening. As a result the steels are soft in the hot-rolled condition. The annealing period required to further improve the properties of the metal is shorter than when no columbium is present.



Chromium Gives Longer Life to High-Manganese Steel Castings — The addition of 1 to 3 per cent chromium to 12 per cent manganese-steel castings increases the initial hardness, which is desirable for wear resistance where impact is not severe enough to work-harden plain manganese steel.

Calcium-Silicon Improves Electric Furnace Steels — Calcium-silicon used as a ladle deoxidizer in wrought steels made in the electric furnace increases the soundness of the steel and improves its hot-working properties.

Columbium or Titanium Widens Use of Austenitic Stainless Steels — When austenitic stainless steels contain columbium or titanium, they are free from intergranular corrosion even after being held at temperatures ranging from 750 to 1,650 deg. F. for long periods. It is possible to use these steels without annealing after welding with columbium-bearing welding rod.

• • •

If you want more information about these and the many other "Electromet" ferro-alloys and metals and the service that goes with their purchase, write for the booklet, "Electromet Products and Service."

Electromet
Trade-Mark
Ferro-Alloys & Metals

The word "Electromet" is a registered trademark of Electro Metallurgical Company

PRODUCTS OF A UNIT OF UCC UNION CARBIDE AND CARBON CORPORATION

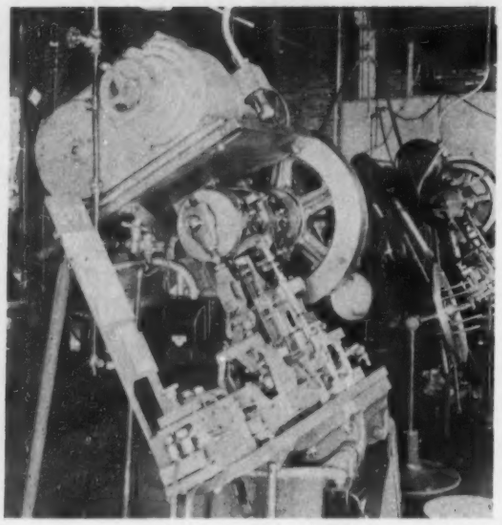


Fig. 2—Showing variable speed transmission and motor mounted on top of press. This is same setup shown in Fig. 1. Note press is inclined to provide better clearance of work

to a considerable degree. In fact, two of the presses have been changed from vertical type to horizontal type to take advantage of the force of gravity in clearing the dies of material. It is expected other presses will shortly be changed over to horizontal type for this same reason.

Fig. 2 shows one of the inclined presses with multiple roll straightener, reciprocating slide feed mechanism and progressive dies. Motor and variable speed transmission are mounted on a platform at the top of the press. In Fig. 1, various parts of the progressive die used on this particular job can be seen between the two posts or guide pins of the die at the extreme right of the pic-

Fig. 3—These 4-slide machines are connected to the variable speed transmission through a flat belt. Driving motor is connected directly to transmission unit

ture and just below the ram of the press. This press also is equipped with a holding mechanism which firmly clamps the strip between feeding operations. This unit can be seen between the reciprocating feed mechanism and the dies. Stationary part of this die totally encloses the strip passing through it and has openings in the top portion through which the various cutting and forming tools operate. Five of these cutting and forming tools may be seen at the extreme right in Fig. 1.

Figs. 3 and 4 show 4-slide presses which apply force to the work from four directions. These machines are capable of forming a complete circle if desired, and their extreme flexibility permits making special Speed nuts for particular applications, some of these Speed nuts being quite intricate in formation. All of the 4-slide presses and all the new presses being installed in this plant are equipped with variable speed transmissions.

Permit Raising Speed

These transmissions not only permit adjusting dies and feeds when setting up the press but also permit raising the speed to where one or more limiting factors come into play. In actual operation, the speed of a press is increased gradually and the quality of the work checked carefully to see that it remains uniform. When too high a speed has been reached, the operation of the dies is not uniform so speed is adjusted just below this point to where the forming operations are uniformly accurate and there are no burrs or fins on the cut edges.

Another factor limiting maximum speed is the possibility of breaking the dies or damaging the fine edges of the dies. However, the variable speed transmissions do permit the highest possible speed coincident with safe operation.

Some idea of the excellent results obtained by use of variable speed transmission units in this plant can be obtained from the following figures.

On a small high-speed press used for punching, forming and cutting off of small Speed nuts in one operation, former speed was 14,000 strokes (14,000 Speed nuts) per hour. With the variable speed transmission, it was found possible to increase this to 18,000 per hour.

On another press where change gears had been employed previously, the highest possible operating speed appeared to be 9000 strokes per hour. However, with variable speed transmission it was found possible to increase this speed to 14,000 strokes per hour and still obtain high quality work.

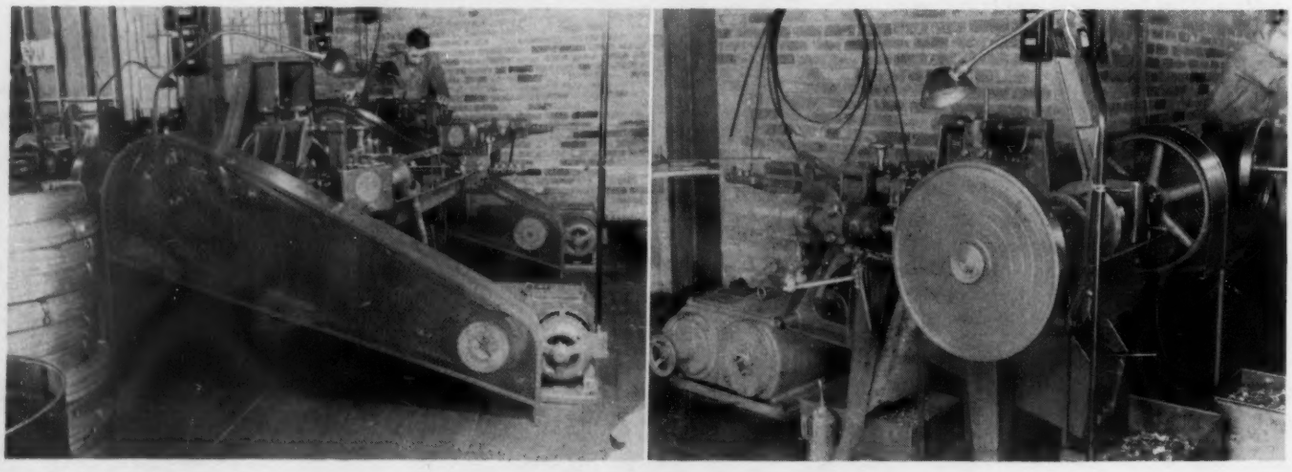
Production on the 4-slide machines jumped from 7000 per hour to 10,000 per hour when the variable speed transmission units were installed. In this instance the extra 24,000 pieces produced per eight-hour day are estimated to increase earning power of each machine about $10 per day. This means the installations frequently pay for themselves within 90 days. After this the increased production is added return from the equipment.

Results of using variable speed transmissions at this plant have been so satisfactory that it has been decided to install them on all new presses and possibly on more of the older ones.

Metal Cutting Analyzed

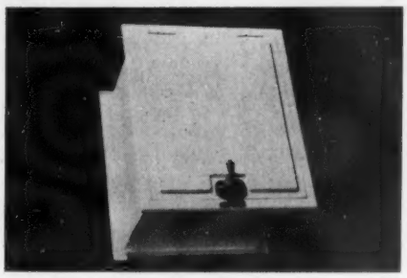
■ Metal cutting and chips are studied and pictorially presented in "Physics of Metal Cutting" by Hans Ernst. Illustrations of stress distribution, diagrams, and photomicrographs are used in an unusually clear treatment of the subject. Copies of the pamphlet may be obtained from Cincinnati Milling Machine Co., Cincinnati.

Fig. 4—Another 4-slide unit. These machines handle complicated forming operations. Here variable speed transmissions easily pay for themselves in 90 days



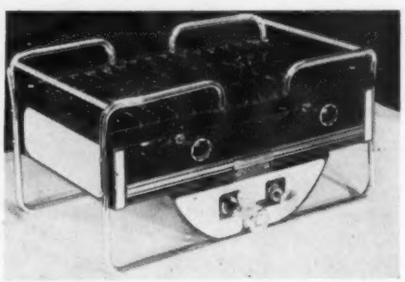
NEW METAL PRODUCTS

■ A new steel milk and package receiver constructed of pressed steel and electrically welded has been developed by Majestic Co., Huntington, Ind. Inner door has refrigerator-type lock and handle which cannot be opened from outside. Exterior door has knob and bullet-



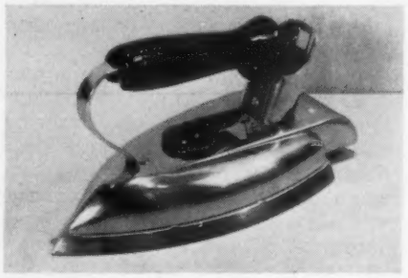
type catch which keeps door firmly closed. Receiver body is 12¾ inches wide by 10¾ inches high. Inside and outside of receiver are finished in white mar-proof enamel.

■ A marine stove with streamlining featuring sturdiness as well as lightness has been designed for E. J. Willis Co., 91 Chambers street, New York by Designers for Industry, Inc., Terminal Tower, Cleveland. Stove features the use of chromium plated tubing for legs and rail, unhampered air circulation



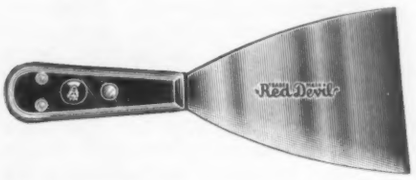
around base and tank and elimination of grease and dirt catching crevices. A new type guard rail permits use of larger utensils and keeps them on grill during rough weather. Mechanical improvements include positive quick-lighting burners and nonwarping top grill.

■ A streamline automatic iron "Pacemaker" has been added to



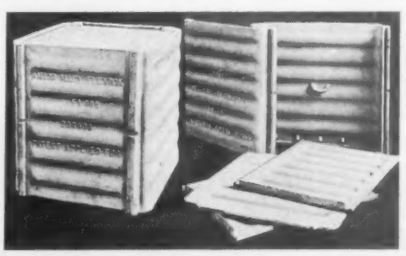
line of household appliance of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Iron has a heat-control lever marked with names of fabrics so that right heat for any fabric may be selected. Base is constructed in such a way as to keep heat concentrated in ironing surface, making top and handle much cooler. Iron has fatigue-proof sloping handle, weighs five pounds, has 115-volt heating element rated at 850 watts. Six-foot detachable cord has soft rubber attachment plug. Iron can be operated only on alternating current. Approved by Underwriters' Laboratories.

■ Putty knives and wallpaper scrapers featuring streamlined handles of red tenite and blades of mirror polished tool steel have been announced by Landon P. Smith, Inc., Irvington, N. J. Tenite cannot chip, split or break. Red color



makes the tool easy to find when misplaced. Steel handles are permanently locked in tenite by solid brass compression rivets. Knives and scrapers are available in stiff and flexible models with 1¼, 1½ and 2-inch blades for knives and with 2½, 3, 3½ and 4-inch blades for scrapers.

■ Sectionalized heat treating boxes manufactured by American Manganese Steel division, Chicago Heights, Ill., mechanically avoid stresses set up by contraction and expansion resulting from rapid heating and cooling. Boxes do not



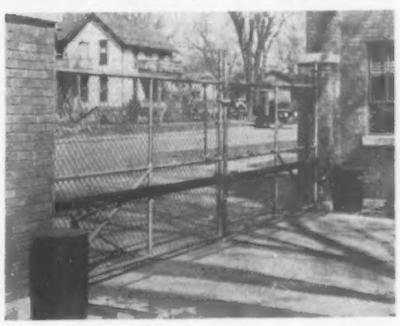
allow any appreciable gas leakage at vertical joint. Ends are made with vertical grooves into which fit corresponding tongues on side castings. Matched slots in both tongue and groove hold pins to prevent relative vertical movement of parts. Sufficient clearance between tongue and groove allows for expansion and contraction thus avoiding distortion or cracking. Sections of boxes are easily and quickly replaced at fraction of cost of replacing an entire box.

■ A revolving assembly of welded steel bins in one compact unit, made by Noggle Products Co., Ann Arbor, Mich., is available in a unit containing 24 bins each 3 x 3 x 2½ inches or 24 bins each 4 x 4 x 3 inches. Double width bin can be

substituted for any pair of single width bins. Bins are 26 gage steel, spot welded and finished in green.

■ Stainless steel grounding resistor announced by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., operates at high temperatures outdoors. Rapidly rising resistance value, because of rapid heating, decreases fault current and places less stress on resistor. Resistor cools quickly and is suited for frequent operation.

■ Electric operators for single-leaf swinging gates are announced by Barber-Colman Co., Rockford, Ill. It also operates a latch which automatically locks gate when in closed position. Operator has heliocentric speed reduction, limit switch, adjustable friction clutch, latching mechanism and is available in two models, Q and QR. Model Q requires constant contact of central station while Model QR is equipped with a relay and requires but momentary contact. Latter model can be controlled by driveway plate or by radio control.



Classifying

(*Concluded from Page 54*)

warehouse from rolling mills, classified, placed in stock and stock sheets sent out to prospective customers at intervals of two weeks. Two stock lists, one on tin mill black plate and one on tin plate, each showing about 400 different items, are sent out. Material goes to some 150 different manufacturers, the largest consumers among whom probably are manufacturers of containers, toys, signs, metal cabinets, boxes and lithographed articles of all kinds. On orders for material in larger quantities than available, the material is allowed to accumulate in the warehouse until the orders can be filled. About 60 per cent of the material going through the warehouse is black plate and 40 per cent tin plate.

When Tin Mill Products Corp. moved from an old building to the new warehouse at 3411 Smallman street, Pittsburgh, the floor space was increased about 50 per cent to accommodate increased volume, and a study was made to increase efficiency of handling operations in the warehouse as a comparatively small difference in handling costs greatly influences the total cost of doing business since handling includes such a large portion of the work done.

The result was that the power truck was purchased. An actual saving in handling costs, amounting to 50 per cent of the former figure, has been experienced. This significant reduction in costs has been most gratifying.

Most customers of this warehouse are out of town, and shipments leave the warehouse via highway truck and rail, about evenly divided as to quantity. Thus the material enters the warehouse at the north end, is classified and stocked, and leaves out of the south end where trucks haul it away.

In most instances, the highway trucks employed have strong enough floors to permit running the power truck and its load directly into them. This greatly facilitates loading as it eliminates fatigue and effort connecting with hand loading operations. Usually these highway trucks have canvas tops which can be removed to provide sufficient clearance for the power truck. Then with the highway truck backed up to the loading platform and a connecting plate laid, the plant truck easily deposits the sheet packs where desired on the truck floor.

Pushes Packs on Trucks

Sometimes, however, floors of highway trucks are in such poor condition that it is inadvisable to run on it with the plant truck with its load. In such a case, the sheet packs are deposited on the rear end of the highway truck as shown in Fig. 4. Then the power truck is employed to push the sheet packs forward as shown in Fig. 5. Power truck can exert a pushing force of 4000 pounds before the wheels will skid. With a load on the forks to hold the wheels to the floor and increase their grip, a larger force may be exerted. Of course, in most instances only a few hundred pounds of force are necessary to slide the sheet packs forward on the truck. While this method of loading trucks does not utilize the speed and ability of the Towmotor most efficiently, it does show the extreme versatility and flexibility of these units.

•

Insulating Firebrick In Soaking Pit Covers

■ A number of steel companies are using insulating firebrick to an increasing extent in soaking pit covers, according to Babcock & Wilcox Co., 85 Liberty street, New York. This is because such construction lightens cover structure with resulting economies in handling covers and reduced damage to brickwork, and also because such covers have long service life as a consequence of their low heat storage capacity and low thermal conductivity.

A 5-foot 6-inch by 14-foot 11-inch cover on a pit operated at 2600 degrees Fahr., and fired with producer gas heating 20 to 24-inch stock in approximately 6-foot lengths, operated continuously for five months before any repairs were necessary. These first repairs were directly attributable to careless handling of cover but were not serious. With occasional repairs, this cover was in service 38 months before being rebuilt. In the same cover heavy firebrick had required repairs after 3 months and gave an overall service life of only 8 months.

Another company rebuilt a soaking pit by removing the dividing wall between two pits and bolting their two 7 by 9-foot covers together. As existing equipment was unable to lift the resulting 7 by 18-foot cover when heavy firebrick was used, insulating firebrick was employed. This cover has been in service for more than 18 months and gives promise of long life, and three other such 7 by 18-foot and four 7 by 9-foot covers also are in use in the same plant.

Some soaking pit covers using insulating firebrick have been built using frames designed for heavy firebrick. In these and other installations sprung arch construction has been used with satisfaction. Insulating firebrick also permits use of a flat suspended roof construction in which the brick, properly drilled, are "threaded" onto rods which are suspended from supporting members. This construction permits easy and quick repair and replacement of the cover when necessary.

Plating Aluminum

(*Concluded from Page* 56)

especially with the purer grades like 2S and 3S. Plated 2S sheet may be punched and formed even in crimping dies without demonstrating the least tendency to lift or peel at the points of stress.

Also aluminum die castings, sand castings and wrought or extruded metal may be plated. In any event, this plating shows great resistance to wear, to heat as high as 600 degrees Fahr. and to salt spray tests. Manufacturers have found that 0.0002-inch of nickel will withstand as long as 300 hours on salt spray tests.

Users of the present process are cautioned against employing strong alkaline cleaners since these may cause etching which is not needed. Only a clean metal surface is required.

The Eastman Kodak Co., Rochester, N. Y., has a typical installation of the process. It is used here to plate die-cast aluminum camera cases. This work involves a 15-kilowatt transformer with a tapped secondary so the current during anodizing may be built up gradually to about 5 amperes per square foot. The rest of the equipment is made up of two standard tanks and the usual water rinses.

♦

Analysis of Three-Dimensional Strains

■ A method for analyzing three-dimensional strains on heavy machinery by use of a beam of polarized light on transparent models has been developed by Royal Weller, Ohio State university, Columbus, O. The light beam is focused on the model which is surrounded by oil of optical properties identical to that of the model. Model scatters beam at right angles to original light ray and produces a visible pattern which in effect is a cross-section of model.

From bands of light, magnitude and direction of stress on model can be determined by simple calculations. Chief advantages of this method are claimed to be: The pattern may be photographed for a permanent record; since no heating or cooling are involved, uncertainty of physical constants is eliminated and the theory of superposition may be used; rotating the model gives stress direction and principal values, and eliminates complex calculations necessary with a cut model; model does not have to be destroyed; accuracy of interior points seems better than that obtainable by slicing method.

HANDLED WITH A YALE ELECTRIC TRUCK

7,500,000 lbs.—3,750 tons . . . A lot of tonnage in any man's language. Yet that's what one operator using a Yale High Lift Electric Truck is able to handle in 3 months for the Atlanta Plant of the King Plow Company.

And the units to be handled are not standard in size or shape. They run the gamut from metal scrapes to the heaviest die cuts. A real handling job if there ever was one.

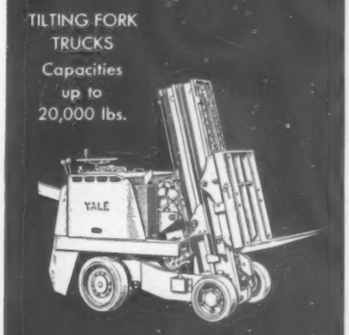
Here's what the King Plow Company has to say about their Yale Electric Truck:

"This truck does a 4-5 day job in 11 hours . . We find many jobs for this equipment which it was not originally installed to do . . . Almost before it was put to work it paid for itself . . . This truck never hesitates even for the longest and steepest ramps . . . It is indispensable—has saved substantially."

Indispensable—Never hesitates—Saved substantially . . . these words means saving and efficiency to the King Plow Company. And they can mean the same to you—for the Yale Electric Truck always conforms to the same service standard—the best.

It has to. Its drive units are more powerful . . . its construction is stronger—its engineering is more advanced. More than just a truck—the Yale Electric Truck is a mechanical efficiency expert! Send for free catalogue giving full information.

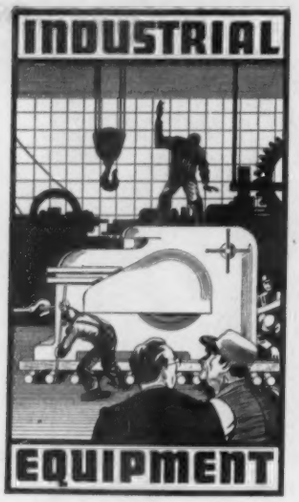
Trained sales engineers are located in 56 major industrial centers ready for instant service. Consult your classified directory.



YALE MARKED .IS YALE MADE

YALE

THE YALE & TOWNE MFG. CO.
PHILADELPHIA DIVISION, PHILADELPHIA, PA., U. S. A.
IN CANADA: ST. CATHARINES, ONT.



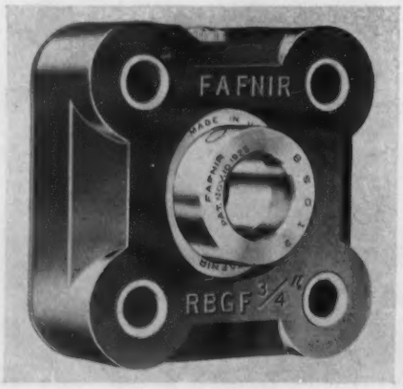
Superfinishing Machine

■ Foster Machine Co., Elkhart, Ind., announces a general purpose superfinishing machine for cylindrical surfaces up to 4 inches in diameter and 18 inches in length, and 6 inches in diameter on shorter lengths. Headstock may be equipped for center, collet or chucking work. Transmission is arranged for an infinite number of spindle speeds up to approximately 550 revolutions per minute. Readings as low as 2 millionths of

an inch are obtainable. Unit detects and removes surface defects, eliminates wear and gives a bearing surface said to be 5 to 10 times smoother than finish obtainable by other methods.

Rubber Cartridge Units

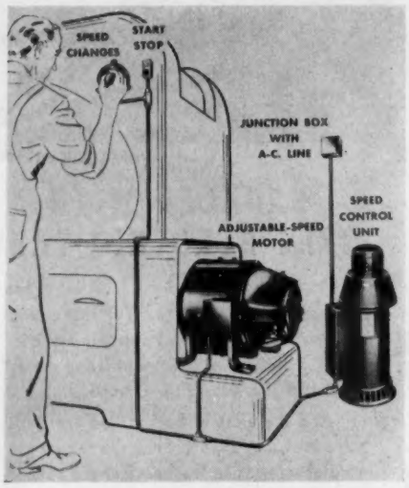
■ The Fafnir Bearing Company, New Britain, Conn., has developed flange and cylindrical cartridge



units. Completely resilient housing insulates bearing, absorbs noise, vibration and automatically compensates for small errors of alignment and longitudinal shaft-expansion. Units are available for all standard shaft diameters from ¾ to 1 7/16 inches and embody wide inner-ring ball bearings with exclusive self-locking collar.

Adjustable-Speed Drive

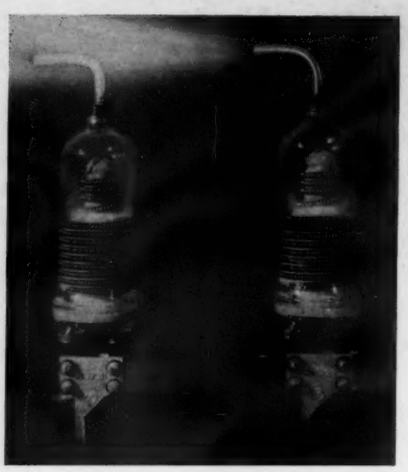
■ Reliance Electric & Engineering Co., 1088 Ivanhoe road, Cleveland, has developed an all-electric, alternating-current, adjustable-speed drive, for motor users having only



an alternating-current power supply, consisting of a control unit and adjustable-speed direct-current motor applied directly to machine to be driven. Unit is supplied for 3-phase, 60 cycle, 220, 440 and 550-volt alternating-curent circuits. Unit varies speeds on small motors (1 horsepower and up) over as much as a 12 to 1 range by variable voltage control. Speed can be changed while motor is operating. Quick stopping is obtained by regenerative braking. Ample torque capacity provided eliminates necessity for clutches. Three screws fastening unit base to floor or other support make careful leveling unnecessary. Packaged control set for 7½-horsepower motor occupies floor space 18 inches square.

Steam Generator Tube

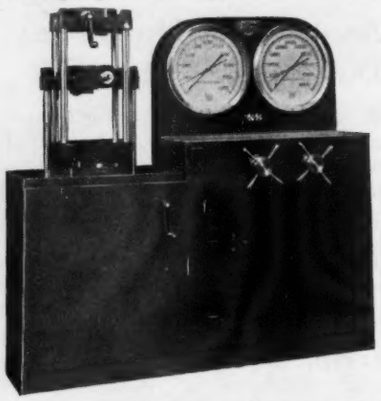
■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has developed a steam generator tube with thermal efficiency of 90 per cent. Heating coils are directly immersed in water, and unit can generate superheated steam from cold water in less than fifteen seconds. One thousand, 1500 and 2000-watt sizes, with evaporating capacities up to 5.7 pounds of water per hour and steam superheated to 350 degrees Fahr. are available. Boiler is 9¼-inches long, is made of trans-



parent glass capable of withstanding internal pressure of 25 pounds per square inch. Resistance wire coiled on an insulating core inside leaves space for only 5 ounces of water.

Testing Machine

■ Tinius Olsen Testing Machine Co., 500 North 12th street, Philadelphia, has put on the market a moderately priced, L-Type hydraulic testing machine with a capacity of 20,000 to 60,000 pounds. Moving piston supplies necessary testing strain. Gear pump is direct-connected with constant operating speed which, when load is applied, produces no measurable pulsation. Testing speeds range from 0 to 2



inches per minute in stepless intervals. Indicating gages are on a separate instrument panel.

Spot-Tamper Compressor

■ Ingersoll-Rand Co., Phillipsburg, N. J., offers its model 55 spot tamper with a single-stage 3-cylinder

Have You Seen This HELPFUL LITERATURE?

Here are the latest industrial publications reviewed for your benefit. They are yours for the asking. There is no charge or obligation. Simply fill in the convenient coupon and return.

(1)—Rust Prevention

James B. Sipe & Co.—4 page illustrated bulletin No. 2071-7344. "Kil-rust" solution, a fluid compound, penetrating and film forming, for use on rusted metal surfaces, is easily applied as an anti-rust preparation or in combination with color pigments, ready-mixed paints and metallic paints. Coupled with "Improvobond," it forms a fully protective coating against corrosion.

(2)—Materials Handling

The Jeffrey Manufacturing Co.—960 page illustrated general catalog No. 87. Full information on conveyors, elevators, chains, sprockets, transmission machinery, electric vibrating feeders, screens, coolers, dryers, crushers, pulverizers, shredders, portable loaders, Etc., and gives full specifications and dimensional information.

(3)—Copper Roofing

Revere Copper & Brass Inc.—44 page illustrated booklet No. 6. Copper roofing and flashings are discussed and information presented on architectural uses and specifications. Cross sections show actual installations as well as project plans.

(4)—Universal Balancer

Taylor Manufacturing Corp.—6 page illustrated bulletin No. 751. The "Hi-Eff" static universal balancer balances the product easily, rapidly and accurately. Available in a wide range of sizes and with direct reading levels.

(5)—Power Cable

Anaconda Wire & Cable Co.—56 page illustrated bulletin No. C-42. Description, applications, physical and electrical properties of rubber insulated power cables, together with methods of proper selection of cables are covered. Other Anaconda products and technical data pertaining to conductors are included.

(6)—A. C. Motor Control

The Electric Controller & Mfg. Co. —8 page illustrated bulletin on the newly announced frequency relay magnetic control for A. C. wound-rotor motors. Describes the new unit and its applications in numerous industries and for applications requiring matched motor acceleration torque and load demands.

(7)—Variable Speed Pulleys

Lewellen Manufacturing Co. — 12 page illustrated catalog No. 40. Variable speed motor pulleys for speed control where space is limited or where it is neither necessary nor practical to use variable speed transmissions. Specifications, tables of ratings and construction details are given.

(8)—Arc Welder

The Lincoln Electric Co.—4 page illustrated bulletin No. 314-A. The 150 ampere "Shield-Arc Junior" welder with self-indicating dual continuous control, in either portable or stationary type, is fully described. Available for either 50 or 60 cycle operation.

(9)—Welding Helmet

American Agile Corp.—Illustrated bulletin supplement No. 121. This light weight fully adjustable helmet affords maximum protection to face, head and neck and incorporates the "Agile" mirror welding lens. This lens protects against ultra-violet rays, increases visibility up to 42 per cent and permits closer inspection of welding arc progress.

(10)—Conveyors

Mathews Conveyer Co.—384 page, plastic bound, pocket size handbook No. HB39, for engineers and plant operating men. Engineering data, specifications and operating data on all types of conveyors are covered. Typical layouts are shown. Cross indexed for reference.

(11)—Agitator

The Patterson Foundry & Machine Co.—4 page illustrated bulletin on the new streamlined "Unipower" agitator, built in sizes from ½-H. P. to 100 H. P. and in a wide range of output speeds. Quiet operation and freedom from vibration are claims made for this new unit.

(12)—Speed Reducers

Stephens-Adamson Mfg. Co.—8 page illustrated catalog No. 7838. Engineering information, specifications and operating data on "SACO" speed reducers are given. Furnished in 4 sizes, with or without V-belts and with output speeds of 14 to 176 RPM.

STEEL
Readers' Service Dept.
1213 West Third St.,
Cleveland, Ohio

MML
6-19-39

Send me the literature I have circled below.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23	24	25	26	27	28		

Name _____

Company _____ **Title** _____

Address _____

City _____ **State** _____

This card must be completely filled out.

FIRST CLASS
PERMIT No. 36
(Sec. 510 P. L. & R.)
Cleveland, Ohio

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in the United States

2c POSTAGE WILL BE PAID BY—

STEEL
Penton Building
CLEVELAND, OHIO

Readers' Service Dept.

HELPFUL LITERATURE

(13)—Refractories

J. H. France Refractories, Inc.—3 illustrated bulletins. Information and description of characteristics of "Nonspall" fire brick, "Franco-Plastic" fire brick refractory for one piece furnace lining, "Hydrecon" hydraulic refractory concrete, and "Corindon Base" high temperature morters, the latter material available in three forms, dry air-set morter, ready mixed air-set morter and dry-set morter.

(14)—Impactors

Pennsylvania Crusher Co.—16 page illustrated pocket size bulletin No. 6000. Impactors as described are designed for reduction of minerals, stones and refractories to minus ⅛-inch with minimum of 100 mesh degradation, from sizes up to 5 and 6 inches. The principle of these units is that of shattering by direct impact, or batting.

(15)—Die Heads

Landis Machine Co., Inc.—14 page illustrated bulletin No. F-90. "Landmatic" die heads for turret lathes, "Lanco" heads for bolt threading machines and "Landex" heads for automatic screw machines, all heat treated, are fully illustrated and described. Advantages are given and full explanation of use covered.

(16)—Presses

The Minster Machine Co.—4 page illustrated bulletin No. 138. Open back inclinable presses in 9 sizes, and in fly wheel or single geared types are fully covered by specifications and descriptive information. Design and structural features are covered.

(17)—Protective Coating

The Watson-Standard Co.—4 page illustrated bulletin on "Plicote" corrosive-proof protective coating. This new resin base coating applied like paint protects against most acids, alkali, brines, gasoline and fruit and food acids.

(18)—Power Transmission

Link-Belt Co.—272 page illustrated book No. 1600. Handbook containing complete design and application data, dimensions, weights, list prices and cross-indexing for design engineers and plant managers. Bearings, clutches, gears, pulleys, safety collars, shafting and couplings, hangers and base plates are covered. The Twin-Disc line of clutches recently acquired by Link-Belt is included.

(19)—Motor Drives

Quality Hardware & Machine Corp. —8 page illustrated bulletin. Individual motor drives for all types of machines to replace overhead line shafts are shown. Descriptions, horsepower requirements and prices of individual drives for lathes, shapers, milling machines, turret lathes, punch presses and drill presses are given.

(20)—Alloy Tubes

The Babcock & Wilcox Tube Co.—Illustrated technical bulletin No. 12. Condensed technical data on high-temperature steels, seamless alloy tubes and pipe for high pressure and temperature services. Full discussions of characteristics of 15 different materials are included.

(21)—Explosion-Proof Motors

Allis-Chalmers Manufacturing Co.—4 page illustrated leaflet No. 2125-C. Construction and installation views, showing explosion-proof motors in a variety of dangerous applications, and information on their use in explosive, fume-laden atmospheres are covered.

(22)—Cleaning Machinery

N. Ransohoff, Inc.—24 page illustrated booklet No. 40. Washing, rinsing, drying, burnishing and pickling equipment for cleaning of metal parts are illustrated and described. Design and structural details are outlined and a partial list of users is included.

(23)—Turbine Generators

Westinghouse Electric & Manufacturing Co. — 48 page plastic bound, illustrated booklet No. B. 2198. The seven principal types of turbines in sizes up to 10,000 kilowatts, with both alternating and direct-current generators, as well as exciters and reduction gears are covered. Installation views, cross-sectional illustrations and four-color charts showing the lubrication system, governor and other control equipment are included.

(24)—Tool Storage

Lyon Metal Products, Inc.—24 page illustrated bulletin No. 175. Visibility, accessibility and compactness are desirable in tool room storage and the steel equipment illustrated and described is designed to incorporate these features. Numerous tool room installations are shown and the flexibility of the units is illustrated in detail.

(25)—Molybdenum

Climax Molybdenum Co.—10 page illustrated loose leaf bulletin "Molybdenum in Gray Iron." Includes data on the use of molybdenum in high strength irons and its effect on the properties of cast iron in heavy sections. This is section 5 of a series of related booklets.

(26)—Sandblast Cleaning

Ruemelin Manufacturing Co. — 4 page illustrated bulletin No. 36-A. A full line of sand blast generators from 50 pounds to 2000 pounds, and accessory equipment are described. A partial list of users is included.

(27)—Materials Handling

Towmotor Co.—24 page illustrated bulletin No. 16. Action pictures of latest materials handling methods using gas power industrial trucks and lift trucks show the varied applications and flexibility of these units.

(28)—Draft Gages

The Hays Corporation—4 page illustrated bulletin on dry-type draft gages for determining the amount of excess air passing through furnaces and boilers. Three types are illustrated.

STEEL
Readers' Service Dept.
1213 West Third St.,
Cleveland, Ohio

MMR
6-19-39

Send me the literature I have circled below.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23	24	25	26	27	28		

Name_____

Company_____ Title_____

Address_____

City_____ State_____

This card must be completely filled out.

FIRST CLASS
PERMIT No. 36
(Sec. 510 P.L. & R.)
Cleveland, Ohio

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in the United States

2c POSTAGE WILL BE PAID BY—

STEEL
Penton Building
CLEVELAND, OHIO

Readers' Service Dept.

compressor of 55 cubic feet per minute actual delivery capacity for tamping low spots in track and other light work on track or bridges and buildings. Unit is mounted with engine on chassis fitted with either end rollers, pneumatic-tired wheels, or plain steel wheels. Handle bars are provided at front and rear. Low platform has depressions for wheels and secure clamping arrangement.

Dial Thermometer

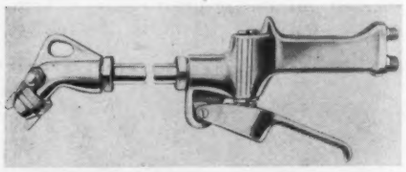
■ Wheelco Instruments Co., 1929 South Halstead street, Chicago, has put on the market a dial-indicating thermometer scaled from 0 to 1000 degrees Fahr. for dry kilns, solder pots, etc. Six-inch white dial face has black numerals. Instrument is available in mercury, gas-filled or vapor actuations, and may be installed at point of temperature taking or at a distance.

Adjustable Pulleys

■ The American Pulley Co., 4200 Wisahickon avenue, Philadelphia, has placed on the market an adjustable diameter wedgbelt pulley. While adjusting collar of pulley is turned with a spanner wrench, side walls making up each groove are regulated, increasing or decreasing pitch diameter for corresponding speed changes. Unit may be applied to both motor and driven shafts. On a drive pulley is equivalent to a half-dozen or more individual sheaves. Range of adjustments between minimum and maximum pitch diameter is infinite. Side walls making up grooves move in or out simultaneously, thus producing belt alignment which is maintained whether belts ride high or low in grooves.

Extension Spray Gun

■ Binks Mfg. Co., 3114 Carroll avenue, Chicago, announces Thor Model No. 23 extension spray gun designed to allow operator to apply paint directly to surfaces that are usually out of reach of spray gun.



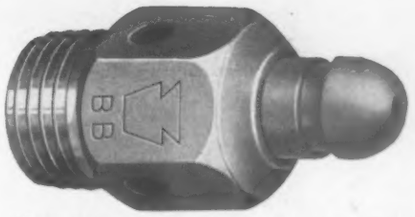
Knurled screw directly behind nozzle head controls width of spray. Unit is available in 3, 4, 5, 6 and 7-foot lengths ranging in price from $40 to $48 complete.

Micrometer

■ The L. S. Starrett Co., Athol, Mass., offers its micrometer No. 436 protected against rust and stain and having wear-resistant spindle tips and anvil for use where abrasive conditions exist. Sleeve and thimble on which are graduations and table of decimal equivalents are made of stainless steel. Units range in sizes from 0 to 24 inches and can be graduated to read in English or metric measure.

Lubrication Fitting

■ Keystone Lubricating Co., 21st, Clearfield and Lippincott streets, Philadelphia, offers combination fitting with a ball head for direct contact with nozzles of standard push type or hydraulic high-pressure grease guns. Unit embodies all features of standard fitting with added



advantage of integral ball head. Reissue Patent No. 20743.

Radial Coupling

■ Morse Chain Co., Ithaca, N. Y., has on the market Morflex radial couplings rated from 2 to 37 horsepower at 100 revolutions per minute and built with rubber bushings as

To Prevent Contact Steel Picks PENOLA

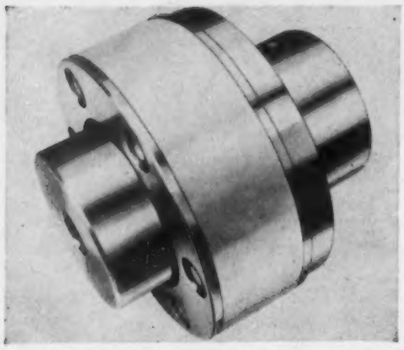
ROLL neck bearings and reduction gears undergo a terrific beating daily... and, in 80% of all 4-high mills, they take it and come right back for more. Why? *Because those mills use Penola lubricants!*

No matter how fine and costly steel mill machinery is, it cannot operate continuously under 5000-pounds-per-square-inch pressure *unless* it is protected from the metal-to-metal contact that ruins bearings and gear teeth.

Experienced steel men count on Penola for that protection! Which explains why Penola produces and sells more steel mill lubricants than any other maker in the world. Rely on Penola—and Penola *will see you through!*

PENOLA LUBRICANTS
Penola Inc., Pittsburgh, Pa.
(Formerly Pennsylvania Lubricating Co.)
New York • Chicago • Detroit • St. Louis

LUBRICANTS FOR THE STEEL INDUSTRY SINCE 1885



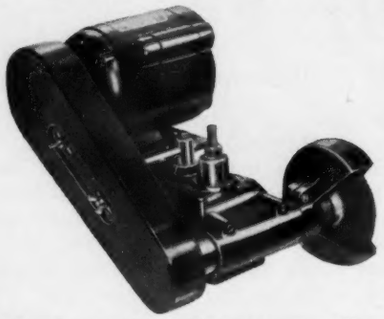
sembled radially, equally spaced, on steel pins of yoke or hub member. Entire coupling is machined to insure balance, and having no metal on metal movement, is insulated against noise and electricity and requires no lubrication.

Insulated Clevis

■ Ohio Brass Co., Mansfield, O., has developed insulated clevis-assemblies of hot-dip galvanized steel. The 2¼-inch spool insulator, held by a 4½-inch long clevis, is for dead-ending and corners on secondary circuits. Two other types, for primary circuits, have a spool insulator 4⅛ inches long. Spools are made of wet process porcelain, same as used in high-voltage insulators, with a tapered hole to evenly distribute mechanical load.

Heavy Grinder

■ The Dumore Co., Racine, Wisconsin, has announced its No. 77 grinder for external or heavy internal grinding having a complete set of



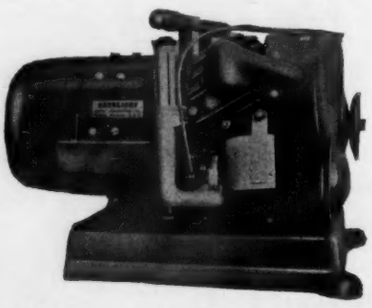
interchangeable sheaves or pulleys allowing speeds from 3810 to 7650 revolutions per minute suitable for wheels of from 3 to 6 inches in diameter.

Variable-Speed Unit

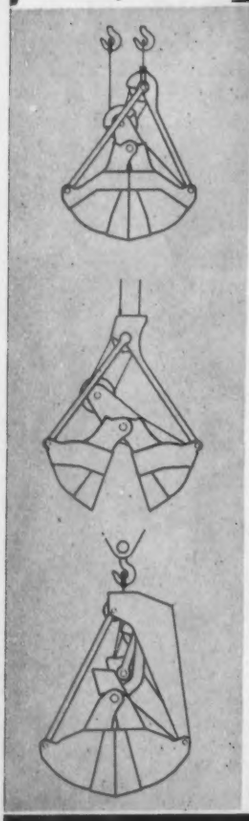
■ Briggs & Stratton Corp., Milwaukee, has announced the manufacture and sale of the Graham unit, now to be called Briggs & Stratton variable speed transmission. Units range from ⅛ to 10 horsepower and have controls including manual, remote mechanical, remote electrical, automatic, etc. Transmission gives speeds in infinite steps from maximum to zero and reverse, permits change in speed both running and stationary and develops full torque over entire range of speed down to zero.

Power Plant

■ Kato Engineering Co., Mankato, Minn., announces its Model 19A Quietlight 350 watts alternating-current or 200 watts direct-current power plant. Light produced is flickerless with partial or full load. Unit carries 25 per cent overload continuously and has close voltage regulation. Plant comes with push button starter, ammeter, cutout, charge control. Plant is completely



shielded and filtered, mounted on sponge rubber mountings and does not have to be bolted down. Gas tank base holds one gallon, enough for 10 hours of operation.



"This 2-line hook-on bucket, used where 2 hook blocks are available, is especially advantageous because:

It is a simple, rugged design having few parts—maintenance expense is low.

It is very easy for the crane operator to handle in picking up and discharging loads."

Blaw-Knox can meet your exacting requirements in bucket design. Send us your specification without obligation.

BLAW-KNOX *Digging and Rehandling* **BUCKETS**

BLAW-KNOX DIVISION
• OF BLAW-KNOX CO. •
Farmers Bank Bldg. Pittsburgh, Pa.

Steelmaking Dips; Demand Irregular

New Business Tends To Level Off; Shapes, Tin Plate Active

MARKET IN TABLOID ★

Demand
Mixed but fairly steady in aggregate.

Prices
Steadier despite occasional concessions.

Production
Down 1 point to 52½ per cent.

■ MIXED trends prevail in finished steel demand. Changes in the aggregate are slight, but a tendency for new business to taper seasonally in some directions is a factor in arresting the recent upturn in ingot production.

Steelmaking last week was off 1 point to 52½ per cent, compared with 27 per cent a year ago. Only moderate fluctuations in output are in prospect the next several weeks, but the resumption of any extended upturn will require greater support than currently is being received from the automotive industry. This is expected the latter part of next quarter.

Meanwhile, tin plate, structural shapes and concrete reinforcing bars continue relatively active and partially are offsetting the seasonal lag in demand from the automotive and farm equipment industries. Railroad steel requirements for equipment building remain slow, but shipyards are well engaged. Machine tool builders are experiencing brisk business, to a large extent foreign, and government armament work is stimulating demand for a few steel products.

Labor continues a cloud in the automotive outlook despite settlement of recent strikes at Detroit and Flint. Steel releases for new model parts, while still light, are gaining gradually, but labor developments may delay plans for the summer changeover in production from current models.

Spurt In Auto Production Offsets Loss From Strike

Automobile retail sales hold the comparative improvement noted the past few weeks, and assemblies are slow to be trimmed. Last week's total of 78,305 units, highest in four weeks, was a gain of 13,000 but resulted entirely from a sharp rise by Chrysler to compensate for its recent shutdown during the Briggs strike. General Motors increased from 30,640 units to 31,910 in the face of the attempted UAW-AFL strike and Chrysler from 8145 to 22,900. Ford slipped from 17,600 to 15,500 and all others from 8820 to 7995. Total output was 87 per cent larger than a year ago.

Several large lots are included in fabricated shape orders and pending business. Awards include 3600 tons for a Rockefeller Center building, New York, and 2400 tons for a bridge, Delta, Calif. Inquiries are headed by 9243 tons for a New Jersey bridge.

Most railroads still defer major programs for equipment buying. Further improvement in carloadings and passage of legislation favorable to the carriers conceivably might stimulate car building in the second half, but steel producers are not counting on any marked revival in demand from this source soon.

Tin Plate Tops Leading Products In Operations

Tin plate, most active of the major products, is continuing 70 per cent operations and apparently will do no better the next several weeks. Sustained shipments during July, with a seasonal tapering the latter half of next quarter, are indicated.

Some progress is being made toward more stable prices for steel, although quiet in new business provides sheet and strip quotations little test. Occasional shading on some other products usually is confined to a few districts. Backlogs of flat-rolled steel gradually are being reduced, with a more rapid movement seen for July and August.

Last week's dip in steelmaking resulted largely from lower schedules at Pittsburgh and Chicago. The former was down 3 points to 40 per cent. Chicago mills, feeling effects of slower business from farm equipment plants, also dropped 3 points to 49½ per cent. Youngstown advanced 1 point to 52 per cent. Cleveland was up 2½ points to 55½, Birmingham rose 4 points to 71 and Cincinnati increased 5 points to 73.

Steady schedules continued at other centers, including 37 per cent in eastern Pennsylvania, 73 per cent at Wheeling, 44 at Buffalo, 40 in New England and 57 at Detroit.

Scrap prices generally are firm despite a leveling off after a steady rise the past few weeks. The composite holds at $14.62. Composite of finished steel prices is unchanged at $55.70.

COMPOSITE MARKET AVERAGES

	June 17	June 10	June 3	One Month Ago May, 1939	Three Months Ago March, 1939	One Year Ago June, 1938	Five Years Ago June, 1934
Iron and steel	$35.71	$35.72	$35.59	$35.80	$36.40	$38.41	$32.96
Finished Steel	55.70	55.70	55.70	56.00	56.50	61.55	55.08
Steelworks Scrap..	14.62	14.62	14.00	14.05	14.98	10.89	10.32

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	June 17, 1939	May 1939	March 1939	June 1938
Steel bars, Pittsburgh	2.15c	2.20c	2.25c	2.45c
Steel bars, Chicago	2.15	2.20	2.25	2.40
Steel bars, Philadelphia	2.47	2.52	2.57	2.47
Iron bars, Terre Haute, Ind.	2.05	2.10	2.15	2.35
Shapes, Pittsburgh	2.10	2.10	2.10	2.25
Shapes, Philadelphia	2.215	2.21½	2.21½	2.40¼
Shapes, Chicago	2.10	2.10	2.10	2.25
Plates, Pittsburgh	2.10	2.10	2.10	2.25
Plates, Philadelphia	2.15	2.15	2.15	2.371
Plates, Chicago	2.10	2.10	2.10	2.25
Sheets, hot-rolled, Pittsburgh	2.00	2.05	2.15	2.40
Sheets, cold-rolled, Pittsburgh	3.05	3.10	3.20	3.45
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.75
Sheets, hot-rolled, Gary	2.00	2.03	2.15	2.40
Sheets, cold-rolled, Gary	3.05	3.08	3.20	3.20
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.80
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.90
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.35
Wire nails, Pittsburgh	2.45	2.45	2.45	2.75

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$37.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	37.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	37.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	43.00	43.00	43.00	47.00

Pig Iron

	June 17, 1939	May 1939	March 1939	June 1938
Bessemer, del. Pittsburgh	$22.34	$22.34	$22.34	$25.34
Basic, Valley	20.50	20.50	20.50	23.50
Basic, eastern, del. Philadelphia	22.34	22.34	22.34	25.34
No. 2 foundry, Pittsburgh	22.21	22.21	22.21	25.21
No. 2 foundry, Chicago	21.00	21.00	21.00	24.00
Southern No. 2, Birmingham	17.38	17.38	17.38	20.38
Southern No. 2, del. Cincinnati	20.89	20.89	20.89	23.89
No. 2X, del. Phila. (differ. av.)	23.215	23.215	23.215	26.215
Malleable, Valley	21.00	21.00	21.00	24.00
Malleable, Chicago	21.00	21.00	21.00	24.00
Lake Sup., charcoal, del. Chicago	28.34	28.34	28.34	30.34
Gray forge, del. Pittsburgh	21.17	21.17	21.17	24.17
Ferromanganese, del. Pittsburgh	85.33	85.33	85.27	107.77

Scrap

Heavy melting steel, Pittsburgh	$15.25	$14.55	$15.75	$11.40
Heavy melt. steel, No. 2, E. Pa.	13.25	12.75	13.40	9.90
Heavy melting steel, Chicago	13.50	12.75	14.25	10.25
Rails for rolling, Chicago	17.75	17.25	17.25	14.90
Railroad steel specialties, Chicago	15.50	14.75	16.25	13.50

Coke

Connellsville, furnace, ovens	$3.75	$3.75	$3.75	$3.90
Connellsville, foundry, ovens	5.00	5.00	5.00	5.05
Chicago, by-product fdry., del.	10.50	10.50	10.50	11.00

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.00c
Chicago, Gary	2.00c
Cleveland	2.00c
Detroit, del.	2.00c
Buffalo	2.00c
Sparrows Point, Md.	2.00c
New York, del.	2.24c
Philadelphia, del.	2.17c
Granite City, Ill.	2.10c
Middletown, O.	2.00c
Youngstown, O.	2.00c
Birmingham	2.00c
Pacific Coast points	2.50c

Cold Rolled

Pittsburgh	3.05c
Chicago, Gary	3.05c
Buffalo	3.05c
Cleveland	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.37c
New York, del.	3.39c
Granite City, Ill.	3.15c
Middletown, O.	3.05c
Youngstown, O.	3.05c
Pacific Coast points	3.65c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast points	4.00c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.80c
Pacific Coast	4.50c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.35c	3.95c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	24.00	35.00
Cold stp.	22.00	22.50	32.00	52.00

Steel Plate

Pittsburgh	2.10c
New York, del.	2.19-2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.42c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, base	2.10c
Sparrows Point, base	2.10c
Claymont, del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c
Pittsburgh	3.35c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast points	2.70c

Tin and Terne Plate

Tin Plate, Coke (base box)

Pittsburgh, Gary, Chicago	$5.00
Granite City, Ill.	5.10

Mfg. Terne Plate (base box)

Pittsburgh, Gary, Chicago	$4.30
Granite City, Ill.	4.40

Bars

Soft Steel

(Base, 3 tons or over)

Pittsburgh	2.15c
Chicago or Gary	2.15c
Duluth	2.25c
Birmingham	2.15c
Cleveland	2.15c
Buffalo	2.15c
Detroit, delivered	2.25c
Philadelphia, del.	2.47c
Boston, delivered	2.52c
New York, del.	2.49c
Gulf ports	2.50c
Pacific Coast points	2.75c

Rail Steel

(Base, 15 to 50 tons)

Pittsburgh	2.00c
Chicago or Gary	2.00c
Detroit, delivered	2.10c
Cleveland	2.00c

Buffalo	2.00c
Birmingham	2.00c
Gulf ports	2.35c
Pacific Coast points	2.60c

Iron

Chicago, Terre Haute	2.05c
Philadelphia	2.37c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Chicago, Gary, Buffalo Cleve., Birm., Young., Sparrows Pt., Pitts.	1.80-2.05c
Detroit, delivered	1.90-2.15c
Gulf ports	2.20-2.40c
Pacific coast ports	2.50c
Philadelphia, del.	1.97-2.22c

Rail steel, straight lengths, quoted by distributors

Pittsburgh, Gary, Chicago, Buffalo, Cleveland, Birm.	1.75-1.90c
Detroit, delivered	1.85-2.00c
Gulf ports	2.10-2.25c
Pacific Coast	2.35c

Wire Products

Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard wire nails	$2.45
Cement coated nails	$2.45
(Per pound)	
Polished staples	3.15c
Galv. fence staples	3.40c
Galv. barbed wire, standard 12½ gage two-point hog, 80-rod spool $2.80; two-point cattle, 80-rod spool	$2.62
Annealed fence wire	2.95c
Galv. fence wire	3.35c
Woven wire fencing (base C. L. column)	67.00
Single loop bale ties, (base C. L. column)	56.00

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago-Birmingham (except spring wire)

Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c

Worcester, Mass., $2 higher on bright basic and spring wire.

Cut Nails

Carloads, Pittsburgh.....$3.60

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.65c	3.35c
Chicago	2.65c	3.35c
Gary, Ind.	2.65c	3.35c
Detroit	2.70c	*3.45c
Cleveland	2.65c	3.35c
Buffalo	2.65c	3.35c

*Delivered.

Alloy Bars (Hot)

(*Base, 3 tons or over*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.70c

Detroit, delivered 2.80c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring flats	0.15
6100 bars	1.20
6100 spring flats	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Electric furnace up 50 cents.

Strip and Hoops

(*Base, hot-rolled, 1 to 20 tons; cold-rolled, 3 to 25 tons*)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.00c
Detroit, del.	2.10c
Philadelphia, del.	2.32c
New York, del.	2.36c
Cooperage hoop, Youngs., Pitts.; Chicago, Birm.	2.10c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.80c
Chicago	2.90c
Detroit, del.	2.90c
Worcester, Mass.	3.00c

Carbon	Cleve., Pitts.
0.26—0.50	2.80c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c

Worcester, Mass $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	2.95c
Detroit, del.	3.05c
Worcester, Mass.	3.35c

Lamp stock up 10 cents.

Rails, Fastenings

(*Gross Tons*)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00
Cents per pound	
Angle bars, billet, mills.	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham.	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up; full containers additional 10%.

Carriage and Machine

½ x 6 and smaller	68.5 off
Do. larger, to 1-in.	66 off
Do. 1⅛ and larger	64 off
Tire bolts	52.5 off

Stove Bolts

In packages with nuts attached 72.5 off; in packages with nuts separate 72.5-12½ off; bulk 84 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts	60 off
Elevator bolts	60 off
Plow bolts	68.5 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
6-inch and less	67	70
⅞-1-inch	64	65
1⅛ and larger	62	62

Hexagon Cap Screws

Upset, 1-in., smaller ..... 67.5 off

Square Head Set Screws

Upset, 1-in., smaller	75.0 off
Headless set screws	70.0 off

Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.75c

Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago	3.40c
⅞-inch and smaller, 11 and 12	63⅛ 54
Pitts., Chi., Cleve.	65-10 off
Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off	

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1⅛ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
⅛	63⅛	54
¼	66⅛	58
1—3	68⅛	60⅛

Iron

¼	30	13
1—1¼	34	19
1½	38	21⅛
2	37⅛	21

Lap Weld

Steel

2	61	52⅛
2½—3	64	55⅛
3½—6	66	57⅛
7 and 8	65	55⅛
9 and 10	64⅛	55

Iron

2	30⅛	15
2½—3½	31⅛	17⅛
4	33⅛	21
4½—8	32⅛	20
9—12	28⅛	15

Line Pipe

Steel

1 to 3, butt weld	67⅛
2, lap weld	60
2½ to 3, lap weld	63
3½ to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63⅛
12-inch, lap weld	62⅛

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15⅛
2 butt weld	32⅛	15
1½ lap weld	23⅛	7
2 lap weld	25⅛	9
2½ to 3½ lap weld	26⅛	11⅛
4 lap weld	28⅛	15
4½ to 8 lap weld	27⅛	14
9 to 12 lap weld	23⅛	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O. D.	13	$ 9.72	$23.71
1¾" O. D.	13	11.06	22.93
2" O. D.	13	12.38	19.35
2¼" O. D.	13	13.79	21.68
2¼" O. D.	12	15.16	.....
2½" O. D.	12	16.58	26.57
2¾" O. D.	12	17.54	29.00
3" O. D.	12	18.35	31.36
3½" O. D.	11	23.15	39.81
4" O. D.	10	28.66	49.90
5" O. D.	9	44.25	73.93
6" O. D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O. D.	13	$ 7.82	$ 9.01
1¼" O. D.	13	9.26	10.67
1½" O. D.	13	10.23	11.79
1¾" O. D.	13	11.64	13.42
2" O. D.	13	13.04	15.03
2¼" O. D.	13	14.54	16.76
2¼" O. D.	12	16.01	18.45
2½" O. D.	12	17.54	20.21
2¾" O. D.	12	18.59	21.42
3" O. D.	12	19.50	22.48
3½" O. D.	11	24.62	28.37
4" O. D.	10	30.54	35.20
4½" O. D.	10	37.35	43.04
5" O. D.	9	46.87	54.01
6" O. D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$42.00-43.00
4-in., Birmingham	45.00-46.00
4-in., Chicago	53.80-54.80
6-in. & over, Chicago	50.80-51.80
6-in. & over, east fdy.	46.00
Do., 4-in.	49.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(*Gross Tons*)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

Pitts., Chi., Gary, Cleve., Young., Buffalo, Birm.	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅜-inch incl.	43.00
Do., over ⅜ to 41/64-in. incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.75
Connellsville, fdry.	4.75- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Terre Haute, del.	10.00
Milwaukee, ovens	10.50
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.00
Indianapolis, del.	10.00
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del.	10.65

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	5.75c

Per ton, bulk, f.o.b. port

Sulphate of ammonia	$28.00

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$22.00	$22.50	$21.50	$23.00
Birdsboro, Pa.	22.00	22.50	21.50	23.00
Birmingham, Ala.‡	17.38	.....	16.38	22.00
Buffalo	21.00	21.50	20.00	22.00
Chicago	21.00	21.00	20.50	21.50
Cleveland	21.00	21.00	20.50	21.50
Detroit	21.00	21.00	20.50	21.50
Duluth	21.50	21.50	.....	22.00
Erie, Pa.	21.00	21.50	20.50	22.00
Everett, Mass.	22.00	22.50	21.50	23.00
Granite City, Ill.	21.00	21.00	20.50	21.50
Hamilton, O.	21.00	21.00	20.50	.....
Neville Island, Pa.	21.00	21.00	20.50	21.50
Provo, Utah	19.00	.....	.....	.....
Sharpsville, Pa.	21.00	21.00	20.50	21.50
Sparrow's Point, Md.	22.00	.....	21.50	.....
Swedeland, Pa.	22.00	22.50	21.50	23.00
Toledo, O.	21.00	21.00	20.50	21.50
Youngstown, O.	21.00	21.00	20.50	21.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	22.39	22.39	21.89	22.89
Baltimore from Birmingham	22.78	.....	21.66	.....
Boston from Birmingham	22.12	.....	.....	.....
Boston from Everett, Mass.	22.50	23.00	22.00	23.50
Boston from Buffalo	22.50	23.00	22.00	23.50
Brooklyn, N. Y., from Bethlehem	24.50	25.00	.....	.....
Canton, O., from Cleveland	22.39	22.39	21.89	22.89
Chicago from Birminghom	†21.22	.....	.....	.....
Cincinnati from Hamilton, O.	21.24	22.11	21.61	.....
Cincinnati from Birmingham	21.06	.....	20.06	.....
Cleveland from Birmingham	21.32	.....	20.82	.....
Mansfield, O., from Toledo, O.	22.94	22.94	22.44	22.44
Milwaukee from Chicago	22.10	22.10	21.60	22.60
Muskegon, Mich., from Chicago, Toledo or Detroit	24.19	24.19	23.69	24.69
Newark, N. J., from Birmingham	23.15	.....	.....	.....
Newark, N. J., from Bethlehem	23.53	24.03	.....	.....
Philadelphia from Birmingham	22.46	.....	21.96	.....
Philadelphia from Swedeland, Pa.	22.84	23.34	22.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	23.45	23.45	22.95	22.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	21.50	21.50	21.00	.....
St. Louis from Birmingham	†21.12	.....	20.62	.....
St. Paul from Duluth	23.63	23.63	.....	24.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $26.50, base; $27.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$20.50	Lake Superior fur.	$25.00
Pitts. dist. fur.	20.50	do., del Chicago	28.34
		Lyles, Tenn.	23.50

†Silvery

Jackson county, O., base: 6-6.50 per cent $25.50; 6.51-7—$26.00; 7-7.50—$26.50; 7.51-8—$27.00; 8-8.50—$27.50; 8.51-9—$28.00; 9-9.50—$28.50; Buffalo, $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	55.10
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar, 85-5

Washed gravel, duty pd., tide, net ton	$21.00-21.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	17.00-18.00
Do, barge	18.00-19.00
No. 2 lump	18.00-19.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $80.00
Do., del. Pittsburgh 85.33

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 28.00
Do., 26-28%, Palmerton 33.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman, 2½ carbon 88.00
2% carbon, 93.00; 1%, 103.00
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.60-1.65

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 10.50c
Do., ton lots 11.25c
Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained chrome 16.50c
Do., ton lots 17.25c
Do., less-ton lots 17.75c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do, less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract, any quantity, freight allowed, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do., less-ton lots 8.25c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.00
Do, smaller lots 2.10

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c

88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, carlots, 2 x ⅛-in., lb. 14.00c
Do, 2% 12.50c
Spot ¼c higher

Silicon Briquets, contract carloads freight allowed, ton $69.50
Carload, spot 74.50
Less-ton lots, lb. 3.75c

Manganese Briquets, contract carloads, bulk freight allowed, lb. 4.50c
Ton lots 5.00c
Less-ton lots 5.25c
Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, gross ton $97.50
Do, spot 102.50

34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24
Boston	3.88	4.06	5.06	3.85	3.85	5.66	3.71	4.78	4.61
New York (Metropolitan)	3.84	3.96	3.96	3.76	3.75	5.56	3.40	4.60	4.50
Philadelphia	3.60	3.60	4.10	3.40	3.40	5.00	3.40	....	4.43
Baltimore	3.70	3.80	4.80	3.55	3.55	5.00	3.55	4.90	4.30
Norfolk, Va.	3.90	4.00	....	3.75	3.75	5.20	3.75	....	5.40
Buffalo	3.35	3.82	3.82	3.62	3.40	5.25	3.35	4.40	4.40
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	4.45	4.50
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.55	4.62
Detroit	3.33	3.43	3.68	3.60	3.65	5.27	3.43	4.50	4.59
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	....	4.57
Chicago	3.50	3.75	3.75	3.55	3.55	5.15	3.35	4.30	4.25
Minneapolis-St. Paul	3.75	3.85	3.85	3.80	3.80	5.40	3.60	4.95	4.50
Milwaukee	3.73	3.88	3.88	3.68	3.68	5.28	3.63	4.58	4.63
St. Louis	3.62	3.72	3.72	3.47	3.47	5.07	3.38	4.32	4.52
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00
Memphis	3.90	4.00	4.00	3.95	3.95	5.71	3.75	....	5.00
Chattanooga	3.80	3.90	3.90	3.85	3.85	5.80	3.65	....	4.40
Tulsa, Okla.	4.54	4.64	4.64	4.41	4.41	6.01	4.32	....	5.29
Birmingham, Ala.	3.50	3.60	3.60	3.55	3.55	5.88	3.35	....	4.85
New Orleans	3.85	4.65	4.65	3.80	3.80	5.75	4.10	....	4.60
Houston, Tex.	3.50	5.85	6.25	4.05	4.05	5.65	3.95	....	5.25
Seattle	3.65	3.85	5.20	3.40	3.50	5.25	3.70	....	4.75
Portland, Oreg.	4.00	4.40	6.10	4.00	4.00	5.50	3.95	6.50	4.75
Los Angeles	4.00	4.50	6.35	4.00	4.00	6.20	4.20	6.30	4.75
San Francisco	3.50	3.90	6.00	3.45	3.45	5.05	3.45	6.40	5.15

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars: 2300	3100
Boston	3.46	4.13	4.18	7.50	6.05	5.80	7.90	8.63	7.23
New York	3.51	4.09	4.04	7.35	5.90	5.65	....	8.59	7.19
Philadelphia	3.66	4.06	3.85	7.31	5.86	5.61	8.56	....	....
Baltimore	....	4.05	3.85	....	....	....	....	....	....
Norfolk, Va.	....	4.15	....	....	....	....	....	....	....
Buffalo	3.42	3.75	3.75	7.10	5.65	5.40	8.50	8.15	6.75
Pittsburgh	3.35	3.65	3.35	7.20	5.75	5.70	7.75	8.25	6.85
Cleveland	3.20	3.75	3.30	7.30	5.85	5.85	7.70	8.15	6.75
Detroit	3.40	3.80	3.38	7.42	5.97	5.72	7.19	8.45	7.05
Cincinnati	3.45	4.00	3.65	7.44	5.99	5.74	8.84	8.50	7.10
Chicago	3.65	3.75	3.65	7.10	5.65	5.40	7.50	8.15	6.75
Minneapolis	....	4.34	3.90	7.45	6.00	8.59	9.19	8.84	7.44
Milwaukee	....	3.93	3.93	7.48	6.08	5.83	7.88	8.48	7.08
St. Louis	3.61	4.02	3.82	7.47	6.02	5.77	7.87	8.52	7.12
Kansas City	....	4.30	....	.	.	....	....	....	....
Memphis	....	4.31	....	....	....	....	....	....	....
Chattanooga	....	4.39	....	....	....	....	....	....	....
Tulsa, Okla.	....	4.79	....	....	....	....	....	....	....
Birmingham, Ala.	....	4.43	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Seattle	....	5.60	5.65	....	7.80	7.65	8.45	....	....
Portland, Oreg.	....	5.60	6.10	9.00	8.00	7.85	8.70	....	....
Los Angeles	4.45	6.00	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	*9.30	6.55	4.50	9.65	8.80	8.65	9.30	10.65	9.80

* Based on minimum quantity.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, June 15

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Quoted in dollars at current value	Continental Channe or North Sea ports, gross tons **Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$23.40 5 0 0	$18.32	2 3 0
Basic bessemer	....	17.89	2 2 0
Hematite, Phos. .03-.05	26.91 5 15 0*	.....	.....
Billets	$34.52 7 7 6	$38.34	4 10 0
Wire rods, No. 5 gage	53.24 11 7 6	42.60	5 0 0
Standard rails	$44 46 9 10 0	$48.99	5 15 0
Merchant bars	2.30c 11 0 0	1.95c to 1.98c	5 2 6 to 5 4 0
Structural shapes	2.09c 10 0 0	1.76c to 1.85c	4 12 6 to 4 17 6
Plates, ¼ in. or 5 mm.	2.29c 10 18 9	2.14c to 2.33c	5 12 6 to 6 2 6
Sheets, black, 24 gage or 0.5 mm	2.72c 13 0 0	2.95c	7 15 0*
Sheets, gal., 24 ga., corr.	3.29c 15 15 0	3.52c	9 5 0
Bands and strips	2.77c 13 5 0	1.95c to 2.00c	5 2 6 to 5 5 0
Plain wire, base	4.08c 19 10 0	2.33c to 2.76c	6 2 6 to 7 5 0
Galvanized wire, base	4.86c 23 5 0	2.99c to 3.09c	7 17 6 to 8 2 6
Wire nails, base	....	2.66c to 2.85c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$ 4.74 1 0 3	....	.....

British ferromanganese $80.00 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich Mark
Fdy. pig iron, Si. 2.5	$23.17	4 19 0(a)	$16.61	626.75	$17.00	500	$25.27 63
Basic bess. pig iron	21.65	4 12 6(a)	.....	....	.....	...	27.88 (b) 69.50
Furnace coke	5.38	1 4 2	5.96	225	6.87	202	7.62 19
Billets	34.52	7 7 6	25.04	945	29.24	860	38.71 96.50
Standard rails	1.99c	9 10 0	1.56c	1,300	2.06c	1,375	2.38c 132
Merchant bars	2.42c	11 12 0††	1.44c	1,202	1.65c	1,100	1.98c 110
Structural shapes	2.17c	10 8 0††	1.41c	1,173	1.65c	1,100	1.93c 107
Plates, ¼-in. or 5 mm	2.29c	10 19 3††	1.82c	1,515	2.06c	1,375	2.29c 127
Sheets, black	3.08c	14 15 0§	2.17c	1,805‡	2.36c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	3.61c	17 5 0	3.30c	2,750	4.13c	2,750	6.66c 370
Plain wire	4.08c	19 10 0	1.74c	1,450	2.48c	1,650	3.11c 173
Bands and strips	2.58c	12 7 0††	1.61c	1,340	1.95c	1,300	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 75 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; †indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	†12.00
Bos. dock No. 1 exp.	13.75-14.00
New Eng. del. No. 1	14.00
Buffalo, No. 1, R. R.	13.50-14.00
Buffalo, No. 1	13.00-13.50
Buffalo, No. 2	11.00-11.50
Chicago, No. 1	13.25-13.75
Chicago, auto, no alloy	12.00-12.50
Chicago, No. 2 auto	10.50-11.00
Cincinnati, dealers	11.00-11.50
Cleveland, No. 1	13.75-14.25
Cleveland, No. 2	12.50-13.00
Detroit, No. 1	9.50-10.00
Detroit, No. 2	9.00- 9.50
Eastern Pa., No. 1	15.50
Eastern Pa., No. 2	13.00-13.50
Federal, Ill.	11.25-11.75
Granite City, R. R.	11.25-11.75
Granite City, No. 2	10.50-11.00
Los Angeles, No. 1	13.00-14.00
Los Angeles, No. 2	12.00-13.00
N. Y. dock No. 1 exp.	12.00-12.50
Pitts., No. 1 (R. R.)	16.00-16.50
Pittsburgh, No. 1	15.00-15.50
Pittsburgh, No. 2	13.50-14.00
St. Louis, R. R.	11.50-12.00
St. Louis, No. 2	10.50-11.00
San Francisco, No. 1	13.00-13.50
Seattle, No. 1	11.00-12.00
Toronto, dirs. No. 1	9.25- 9.75
Valleys, No. 1	14.50-15.00

COMPRESSED SHEETS

Buffalo	11.00-11.50
Chicago, factory	12.50-13.00
Chicago, dealers	11.50-12.00
Cincinnati dealers	10.50-11.00
Cleveland	13.75-14.25
Detroit	11.00-11.50
E. Pa., new mat.	15.50
E. Pa., old mat.	11.50-12.00
Los Angeles	14.00-14.50
Pittsburgh	15.00-15.50
St. Louis	9.50-10.00
Valleys	14.00-14.50

BUNDLED SHEETS

Buffalo, No. 1	11.00-11.50
Buffalo, No. 2	10.00-10.50
Cleveland	9.50-10.00
Los Angeles	14.00
Pittsburgh	13.50-14.00
St. Louis	7.00- 7.50
Toronto, dealers	8.00- 8.50

SHEET CLIPPINGS, LOOSE

Chicago	8.00- 8.50
Cincinnati, dealers	6.50- 7.00
Detroit	7.50- 8.00
†Los Angeles	3.75- 4.00
St. Louis	6.00- 6.50
Toronto, dealers	4.25- 4.75

BUSHELING

Buffalo, No. 1	11.00-11.50
Chicago, No. 1	12.00-12.50
Cincin., No. 1, deal.	7.00- 7.50
Cincinnati, No. 2	2.25- 2.75
Cleveland, No. 2	7.50- 8.00
Detroit, No. 1, new	10.00-10.50
Valleys, new, No. 1	13.50-14.00
Toronto, dealers	3.75- 4.25

MACHINE TURNINGS (Long)

Birmingham	†4.50- 5.00
Buffalo	6.00- 6.50
Chicago	7.00- 7.50
Cincinnati, dealers	4.50- 5.00
Cleveland, no alloy	7.25- 7.75
Detroit	5.00- 5.50
Eastern Pa.	8.50
Los Angeles	4.50- 5.00
New York	†3.50- 4.00
Pittsburgh	8.00- 8.50
St. Louis	4.00- 4.50
Toronto, dealers	4.25- 4.75
Valleys	9.00- 9.50

SHOVELING TURNINGS

Buffalo	7.25- 7.75
Cleveland	7.50- 8.00
Chicago	7.00- 7.50
Chicago, spcl. anal.	8.00- 8.50
Detroit	6.00- 6.50
Pitts., alloy-free	9.50-10.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	2.00
Buffalo	6.75- 7.25
Cincinnati, dealers	3.25- 3.75
Cleveland	7.50- 8.00
Eastern Pa.	6.50- 7.00
Detroit	5.00- 5.50
New York	†2.50- 3.00
Pittsburgh	6.50- 7.00
Toronto, dealers	3.50- 4.00

AXLE TURNINGS

Boston district	†7.50
Buffalo	9.50-10.00
Chicago, elec. fur.	13.50-14.00
East. Pa., elec. fur.	13.00-13.50
St. Louis	9.00- 9.50
Toronto	4.00- 4.25

CAST IRON BORINGS

Birmingham	†6.00- 6.50
Boston dist. chem.	†4.50
Buffalo	6.75- 7.25
Chicago	6.50- 7.00
Cincinnati, dealers	3.25- 3.75
Cleveland	7.50- 8.00
Detroit	5.00- 5.50
E. Pa., chemical	10.00-11.00
New York	†3.50- 4.00
St. Louis	2.50- 3.00
Toronto, dealers	3.75- 4.25

RAILROAD SPECIALTIES

Chicago	15.25-15.75

ANGLE BARS—STEEL

Chicago	15.25-15.75
St. Louis	13.00-13.50

SPRINGS

Buffalo	15.50-16.00
Chicago, coil	16.50-17.00
Chicago, leaf	15.00-15.50
Eastern Pa.	18.00
Pittsburgh	18.00-18.50
St. Louis	14.00-14.50

STEEL RAILS, SHORT

Birmingham	†12.00-12.50
Buffalo	16.50-17.00
Chicago (3 ft.)	16.00-16.50
Chicago (2 ft.)	16.50-17.00
Cincinnati, dealers	16.75-17.25
Detroit	16.50-17.00
Los Angeles	15.00-15.50
Pitts., 3 ft. and less	18.50-19.00
St. Louis, 2 ft. & less	16.25-16.75

STEEL RAILS, SCRAP

Boston district	†13.50-14.00
Buffalo	15.50-16.00
Chicago	13.50-14.00
Cleveland	16.50-17.00
Pittsburgh	16.00-16.50
St. Louis	13.00-13.50
Seattle	16.00

FROGS, SWITCHES

Chicago	13.50-14.00
St. Louis, cut	13.00-13.50

ARCH BARS, TRANSOMS

St. Louis	13.50-14.00

PIPE AND FLUES

Chicago, net	8.50- 9.00
Cincinnati, dealers	6.50- 7.00

RAILROAD GRATE BARS

Buffalo	9.00- 9.50
Chicago, net	7.50- 8.00
Cincinnati, dealers	6.25- 6.75
Eastern Pa.	12.50-13.00
New York	†8.50- 9.00
St. Louis	8.00- 8.50

RAILROAD WROUGHT

Birmingham	†11.00-11.50
Boston district	†9.50-10.00
Eastern Pa., No. 1	16.00-16.50
St. Louis, No. 1	9.75-10.25
St. Louis, No. 2	11.50-12.00

FORGE FLASHINGS

Boston district	†7.50
Buffalo	11.00-11.50
Cleveland	11.00-11.50
Detroit	9.00- 9.50
Los Angeles	9.00
Pittsburgh	13.50-14.00

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.50-16.00

LOW PHOSPHORUS

Cleveland, crops	17.50-18.00
Eastern Pa., crops	17.00-17.50
Pitts., billet, bloom, slab crops	19.00-19.50

LOW PHOS. PUNCHINGS

Buffalo	15.50-16.00
Chicago	15.50-16.00
Eastern Pa., crops	17.50-18.00
Pittsburgh	17.50-18.00
Seattle	15.00

RAILS FOR ROLLING

5 feet and over

Birmingham	†14.00-15.00
Boston	15.00-15.50
Chicago	17.50-18.00
New York	†14.00-14.50
Eastern Pa.	17.00-17.50
St. Louis	16.00-16.50

STEEL CAR AXLES

Birmingham	†15.00-16.00
Boston district	†14.50
Chicago, net	17.50-18.00
Eastern Pa.	20.50-21.00
St. Louis	16.00-16.50

LOCOMOTIVE TIRES

Chicago (cut)	15.50-16.00
St. Louis, No. 1	12.25-12.75

SHAFTING

Boston district	†15.25-15.50
New York	†15.50-16.00
Eastern Pa.	20.50-21.00
St. Louis, 1¼-3¾"	15.50-16.00

CAR WHEELS

Birmingham	†13.50-14.00
Boston dist., iron	†10.00
Buffalo, steel	16.00-16.50
Chicago, iron	13.50-14.00
Chicago, rolled steel	14.50-15.00
Cincin., iron, deal.	12.50-13.00
Eastern Pa., iron	15.50-16.00
Eastern Pa., steel	18.00
Pittsburgh, iron	14.50-15.00
Pittsburgh, steel	18.00-18.50
St. Louis, iron	14.00-14.50
St. Louis, iron	14.00-14.50

NO. 1 CAST SCRAP

Birmingham	†13.00-13.50
Boston, No. 1 mach.	†11.00-11.50
N. Eng. del. No. 2	12.00-12.50
N. Eng. del. textile	12.50-13.00
Buffalo, cupola	13.00-13.50
Buffalo, mach.	14.00-14.50
Chicago, agri. net	9.50-10.00
Chicago, auto net	12.50-13.00
Chicago, railroad net	11.00-11.50
Chicago, mach. net	12.00-12.50
Cincin., mach. deal.	12.00-12.50
Cleveland, mach.	17.00-17.50
Detroit, cupola, net	12.50-13.00
Eastern Pa., cupola	16.00-16.50
E. Pa., mixed yard	13.50-14.00
Los Angeles, net	13.50-14.00
Pittsburgh, cupola	15.00-15.50
San Francisco, del.	13.50-14.00
Seattle	12.00-14.50
St. Louis, cupola	12.00-12.50
St. Louis, agri. mach.	14.00-14.50
St. L., No. 1 mach.	14.50-15.00
Toronto, No. 1, mach., net	12.00-12.50

HEAVY CAST

Boston dist. break.	†9.50
New England, del.	12.50-13.00
Buffalo, break.	11.00-11.50
Cleveland, break, net	13.00-13.50
Detroit, auto net	12.50-13.00
Detroit, break	9.50-10.00
Eastern Pa.	14.75
Los Ang., auto, net	13.50
New York, break.	†10.50-11.00
Pittsburgh, break.	12.50-13.00

STOVE PLATE

Birmingham	†7.50- 8.00
Boston district	†8.00- 8.25
Buffalo	11.50-12.00
Chicago, net	7.75-8.25
Cincinnati, dealers	6.25- 6.75
Detroit, net	7.00- 7.50
Eastern Pa.	12.50-13.00
New York, fdy.	†10.00-10.50
St. Louis	7.50- 8.00
Toronto dealers, net	6.50- 7.00

MALLEABLE

Birmingham, R. R.	†10.50-11.00
New England, del.	11.50-12.50
Buffalo	13.50-14.00
Chicago, R. R.	15.00-15.50
Cincin., agri., deal.	10.75-11.25
Cleveland, rail	15.50-16.00
Eastern Pa., R. R.	15.00-16.50
Los Angeles	17.50-18.00
Pittsburgh, rail	15.00-15.50
St. Louis, R. R.	12.25-12.75

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbessemer	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbessemer	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-9.25
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, c.i.f. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00
No. Afr. low phos.	12.00
Swedish low phos.	12.00
Spanish No. Africa basic, 50 to 60% nom.	10.00-10.50
Tungsten, short ton unit, duty pd. nom.	$17.50-18.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$23.00-24.00
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% nom.	29.00
So. African, 50-52% nom.	29.00
Indian, 49-50%	27.00-28.00

—The Market Weeks—

Sheets, Strip

Sheet and Strip Prices, Pages 82, 83

Pittsburgh—Sheet and strip shipments continue to gain slowly without benefit of heavy automotitve releases. The latter are overshadowed by increased miscellaneous demand. Production is steady, sheet mills holding at 55 per cent and strip near 35. Galvanized output has declined further to 50 per cent. Summer outlook is for sustained sheet operations.

Cleveland — Flat-rolled steel deliveries are fairly heavy, swelled by the movement of low-price tonnage booked a few weeks ago. Shipments include only a small amount of automotive material. Releases from partsmakers for 1940 models are increasing, but demand from motor companies is expected to be relatively light for another 60 days, with an accompanying retarding effect on total production of sheets and strip. Prices are regaining stability but are tested by only small lots.

Chicago—Flat-rolled steel releases are heavier. Automobile builders and partsmakers are specifying more heavily than was expected by some sheet producers but are not counted on for substantial lots until next quarter. New business is light.

Boston—New buying is light, but specifications are heavier, resulting in some increase in output of cold strip, mostly from consumers outside New England. Demand from makers of small tanks and containers is light and stampers' requirements also are off slightly.

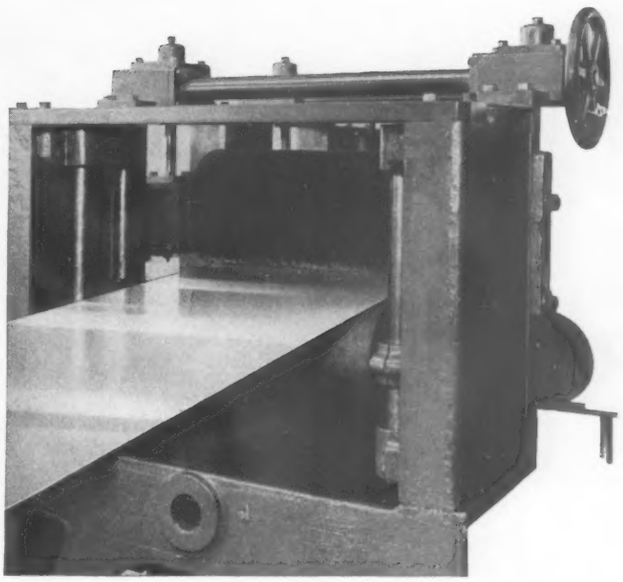
New York—Sheet specifications are heavier than expected. Releases from household appliance and metal doors and door bucks makers are holding up well, reflecting improved activity in small apartment and residential building. Prices are steadier. Recent reports of additional unsettlement apparently had their inception in adjustments to customers who did not receive the lowest prices that prevailed subsequent to the placing of certain orders last month. Such adjustments are claimed to have been granted only on tonnages placed during the early part of the breakdown in prices and to have involved no increase in size of original orders.

While cold strip prices are gradually being steadied, some business under 3.00c, Worcester, continues to be taken although current buying is light and spotty. Producers are pressing for releases on low-price material booked recently.

Philadelphia—Sheet specifications are fair, exceeding those a month

STEP UP PRODUCTION

CUT FINISHING COSTS



MANUFACTURERS of light gauge metal save *two* ways when they install Pittsburgh Plate Glass Company's Spiral Wound Brushes on their production lines. Such an installation never fails to increase output and to bring a substantial reduction in finishing expense.

Investigate! Spiral Wound Brushes are available in nickel silver wire, horsehair and tampico. And all are refillable.

Consult with our engineering representatives. They will will gladly work with you in developing Spiral Wound Brushes to meet your particular finishing requirements. Write or telephone today.

PITTSBURGH
PLATE GLASS COMPANY
BRUSH DIVISION · BALTIMORE, MD.

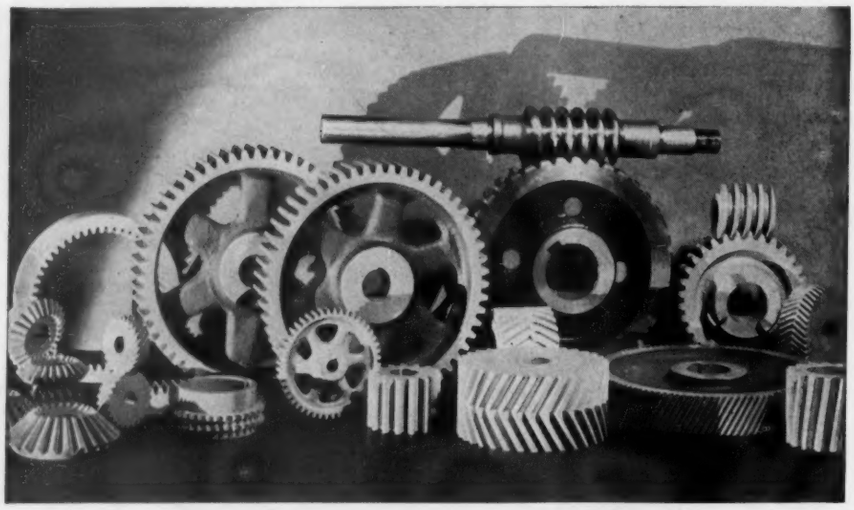
ago. New orders are light. Specifications from radio set builders are active.

Buffalo—Sheet and strip production is fairly active, with releases coming through satisfactorily, but some letup is seen not improbable when books are cleared of low-price tonnage. Automotive demand largely covers fill-in needs for the remainder of current model production.

Cincinnati — Sheet specifications barely represent 50 per cent of capacity, with automotive releases lighter than usual. New business continues fair despite backlogs acquired during the recent price dip. Galvanized sheet shipments are disappointing.

St. Louis — Specifications for sheets and strip are steady, with new business lagging. Most leading consumers are well covered for third quarter. Better business in galvanized sheets is looked for next month, when farm repair work gets under way.

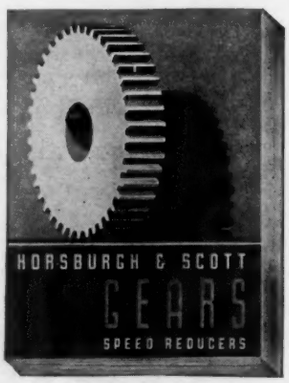
Birmingham, Ala. — Output of sheets is estimated at slightly better than 60 per cent, the larger part roofing. A slight increase in production of strip, due to approach of the cotton season, also is noted.



GEARS! GEARS! GEARS!

FROM AN OUNCE TO 20,000 POUNDS

● Whether you require Spur, Spiral, Helical, Herringbone, Bevel, Mitre, Internal or Worm Gears or Worms or Non-metallic Pinions . . . here they are . . . the finest made. For nearly half a century Horsburgh & Scott has concentrated on making gears that represent the best in engineering design, accurate workmanship and fine materials. Best of all, they're not expensive because they're standardized and made to endure. On your next order try these finest of gears.



Send for this valuable 448 page Reference Book.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE, CLEVELAND, OHIO, U. S. A.

Plates

Plate Prices, Page 82

Boston—Plate buying is light, except from shipbuilders. At least 10,000 tons is included for release over the next year or more by district shipyards. Structural, boiler and miscellaneous fabricating shops are buying sparingly. Prices are still subject to shading of about $2, generally through waiving of extras or other indirect means, although some base concessions are noted.

New York—Plate orders are spotty and include few important awards. Outstanding in prospective railroad buying are 1110 freight cars for the Western Maryland, bids June 22. District shipyards are not expected to be in a position to figure on building of 12 merchant ships on which the maritime commission will open bids July 11 and which will take about 30,000 tons of steel, mostly plates. Prices continue soft.

Philadelphia—Buying is sluggish, although the Reading Co. has started distribution of 500 tons. Ship releases, slow lately, are expected to be stimulated by new work scheduled to start soon at Chester, Pa. Pennsylvania railroad has yet to buy 500 tons of plates for 25 tenders it will build or material for 105 locomotives it plans to repair.

Birmingham, Ala.—Plate bookings have shown some increase, due to orders from drum manufacturers and some miscellaneous business. Output is estimated at about 65 per cent.

San Francisco—The only pending plate business of size calls for 400 tons for a penstock near Sonora, Calif., for Pacific Gas & Electric Co., San Francisco. Awards and other inquiries are limited to lots of less than 100 tons. So far this year 17,249 tons have been placed, compared with 14,246 tons for the same period a year ago.

Plate Contracts Placed

205 tons, municipal standpipe, Warren, O., to Warren City Tank & Boiler Co., Warren, O.

Plate Contracts Pending

400 tons, penstock for Pacific Gas & Electric Co., near Sonora, Calif.; bids opened.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 83

Bolt and nut producers in most

instances have yet to open third quarter books, although some buyers have requested contracts. Sellers are under little pressure to accept forward orders and apparently prefer to await clarification of the price situation before naming quotations for the next period.

Bars

Bar Prices, Page 82

Cleveland—Bar demand is quieter in some directions, volume being lighter than for several weeks. New model preparations in the automobile industry are accompanied by small gains in releases from partsmakers, but so far only small lots are involved and direct buying reflects approaching completion of current model assemblies. Alloy bar producers have increased prices on minimum quantities, although the base quotation is unchanged. Under the revised schedule quantities of 2000 pounds and less take warehouse prices. Formerly mills charged the same as warehouses on lots of 1000 pounds and less.

Chicago—Carbon and alloys bars are slower, tapering closely with automotive and agricultural equipment interests' declining needs. Farm equipment requirements are expected to slacken further the next 30 days, but automotive needs may show a slight improvement when preparations are made for early runs on new models.

Boston—Consumers are operating mostly on stocks, with requirements off slightly. Nearly 100 tons of nickel steel and other alloy bars has been placed by the Boston navy yard for chain-making. Shipbuilding releases are well maintained.

Philadelphia — Commercial bar sellers again are advising large quantity buyers that the previously announced advance of $1 a ton on maximum quantities will go into effect July 1, thus refuting recent reports to the contrary.

Birmingham, Ala.—Due in main to the tonnage accruing from miscellaneous construction projects in Alabama and adjacent states, bar production has held consistently close to 55 per cent. Demands from agricultural implement builders are disappointing.

Tin Plate

Tin Plate Prices, Page 82

Specifications continue sufficiently active to support tin plate operations at 70 per cent. While demand is expected to be sustained fairly well for a few more weeks, production is believed to have reached its spring peak. From a production standpoint tin plate is the most active of major steel products.

Pipe

Pipe Prices, Page 83

Pittsburgh — Shipments of oil country goods the first half of June were up slightly, but demand still is regarded below normal. Merchant pipe continues aided by increased building demands, movement from consigned stocks being better this month than in either April or May.

Cleveland—Movement of standard pipe is heavier than a month ago in some directions. Oil country demand still is light as regards drillers' requirements. Line pipe business has been fair lately, most orders being for comparatively small gathering lines. Several larger lines remain in the conversational stage, but

1. Free-acting, flexible assembly can't bind, sag, warp or pull apart. More durable!
2. All-steel curtain repels fire, defies wind, weather, and burglary. Protection plus!
3. Because of its resilience, the door will absorb sharp impacts. More resistant!
4. In case of accidental damage, it allows for economical repair, because slats can be easily replaced.

Kinnear originated the interlocking-slat type of rolling door--not merely because it was *different,* but because it was *better,* more durable, more economical. For in addition to the advantages outlined above, Kinnear Rolling Doors save maximum floor and wall space; they operate quickly, smoothly and easily the year around; they open completely out of the way, safe from damage;--and they're more convenient from every standpoint! For any doorway, in old or new buildings, with motor or manual control. Send for the fully illustrated Kinnear Catalog TODAY!

KINNEAR ROLLING DOORS

Offices and Agents in Principal Cities

The KINNEAR Manufacturing Company

1780-1800 FIELDS AVE. COLUMBUS, OHIO

Factories: Columbus, Ohio and San Francisco, Cal.

it is difficult to determine if and when they will materialize.

Boston—Moderate buying of pipe continues against plumbing and heating contracts for building work started several months ago. Most of this is going through resale outlets at steady prices, with some scattered shading in Connecticut. Cast pipe demand is slower, although eastern foundries have fair backlogs. Utility buying so far this year has been light.

Birmingham, Ala.—Widely scattered tonnage, mostly small lots, is holding pipe production at an even rate. Recent bookings include some tonnage from South Pasadena, Calif., Seattle and from some points in Florida. Operations are on a four and five day a week basis, and inquiries are reported fairly consistent.

San Francisco—Awards of 2895 tons of cast iron pipe were the largest so far this year, bringing the total to date to 16,366 tons, compared with 14,287 tons for the corresponding period in 1938. The East Bay Municipal Utility District, Oakland, Calif., awarded 1500 tons of 4 to 20-inch to United States Pipe & Foundry Co. and 250 tons to American Cast Iron Pipe Co. The former was the only bidder on 200 tons for Portland, Oreg. Bids open on June 19 for 138 tons of 3 to 6-inch, cast iron or steel pipe for Columbia City, Oreg.

Seattle—H. G. Purcell, Seattle, representing U. S. Pipe & Foundry Co., will furnish 700 tons of 8 to 16 inch water mains for the Garfield street extension, Seattle. Same agency is also low at Portland for 200 tons of 8-inch cast iron water mains.

33 years
1906-1939
DAMASCUS
Manganese and Alloy Steel
CASTINGS
FROM ½ TO 1000 POUNDS

Produced in our modernly equipped foundry from electric furnace steel and heat-treated in automatically controlled gas-fired furnaces.

We are in position to manufacture specialties made of manganese and alloy steel castings and invite concerns to write us about their requirements.

DAMASCUS STEEL CASTING CO.
New Brighton, Pa.
(Pittsburgh District)

Cast Pipe Placed

1750 tons, 4 to 20-inch, east bay municipal utility district, Oakland, Calif.; 1500 tons to United States Pipe & Foundry Co., Burlington, N. J., 250 tons to American Cast Iron Pipe Co., Birmingham, Ala.

753 tons, 8 to 16-inch, improvement, West Garfield street, Seattle, to H. G. Purcell, Seattle, for United States Pipe & Foundry Co., Burlington, N. J.

375 tons, 6 and 8-inch, Inglewood, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

200 tons, Portland, Oreg.; United States Pipe & Foundry Co., Burlington, N. J., only bidder.

138 tons, 3 to 6-inch, cast iron or steel, Columbia City, Oreg.; bids opened.

Unstated tonnage, Warren avenue improvement, Seattle; bids soon; $115,000 available.

Wire

Wire Prices, Page 83

Pittsburgh — Wire production is up slightly, with June to date somewhat ahead of May. However, the gain is below expectations. Heavier specifications from manufacturing consumers account for the betterment, but only small automotive lots are included. Merchant products are moving slowly.

Cleveland—Wire orders are slightly better than a month ago, although latest gains have been slight. Automotive requirements are maintained somewhat better than was anticipated a short time ago, but it is too early for heavy demand in connection with new models. Merchant products continue rather quiet.

Boston — Wire business is barely holding its own. Manufacturers' wire specifications are steady, and the number of specialty orders is impressive though demand is spotty. Merchant products continue to drag, distributors generally having covered heavily earlier in the year. Wire rod volume has slackened. Some shading is reported on flat wire,

while electrical building wire prices also are weak.

New York—Some forward buying of manufacturers' wire for third quarter delivery has developed, but on the whole volume reaching the mill is barely maintained with more consumers preparing for a slower period next month. Little business is coming from the automobile industry. Rods and flat wire specialties are inclined to drag. Export inquiry for rods has appeared recently, but at unattractive prices.

Birmingham, Ala.—Wire demand, in comparatively small orders, continues second to sheets. Output, however, has slackened somewhat from the peak attained earlier in the year. Current production is close to 65 per cent.

Rails, Cars

Track Material Prices, Page 83

Opening of bids June 22 on 1110 freight cars by the Western Maryland is the high point in railroad buying, little other business being in sight. Several carbuilding programs are in the making but have not reached a definite stage. Rail mills continue to receive some rail releases but backlogs are being reduced steadily and no new inquiry is coming out.

A few cars have been placed by industrial concerns, for special purposes.

Car Orders Placed

Aluminum Co. of America, ten 70-ton covered hoppers, to Pullman-Standard Car Mfg. Co., Chicago.

Republic Steel Corp., four 50-ton air-dump cars, to Pressed Steel Car Co., Pittsburgh.

Car Orders Pending

Tennessee Valley authority, thirty 40-ton hoppers, new or used.

Locomotives Pending

Boston & Maine, six 600-horsepower diesel-electric switchers.

H. C. Frick Coke Co., three electric locomotives.

Buses Booked

American Car & Foundry Motors Co., New York: Eight for Triborough Coach Co., Astoria, L. I.; one for Carolina Coach Co., Raleigh, N. C.

Twin Coach Co., Kent, O.: Sixty-seven 40-passenger for North Shore Bus Co., Flushing, N. Y.; seven 29-passenger for Milwaukee Electric Railway & Transport Co., Milwaukee; six 37-passenger for Railway Equipment & Realty Co., Oakland, Calif.; five 33-passenger for Valley Motor Transit Co., East Liverpool, O.

Shapes

Structural Shape Prices, Page 82

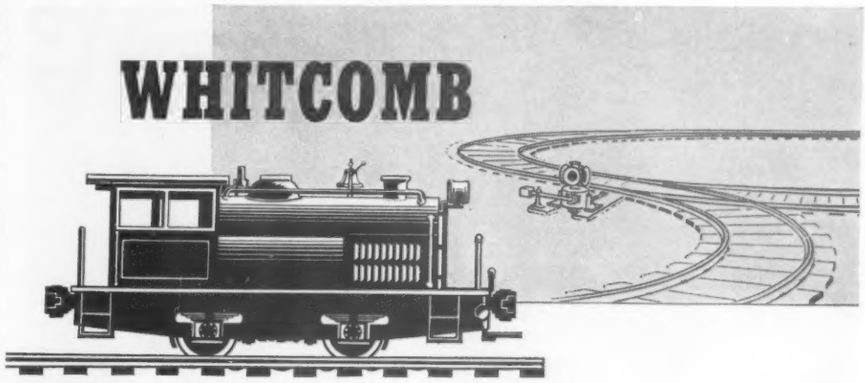
Pittsburgh — Activity has been somewhat less in the structural market, although tonnages remain virtually the same. Several larger jobs have been placed and two new inquiries over 1000 tons each pend.

Awards include 3600 tons to Bethlehem Steel Co., Bethlehem, Pa., for a store and office building in Rockefeller Center, New York.

Largest new inquiry is for 4500 tons of structurals for the administration building in the new municipal center in Washington.

Chicago — Market for structural steel appears brighter, with awards heavier and increased inquiries for small projects. Largest inquiry involves 2000 tons of structurals for contract S-3, a section of the State street subway, Chicago, bids on the general contract June 29. Also involved are liner plates and beam ribs, at least 8000 tons.

Boston — Inquiry for structural



for Switching Economy

Industry long ago learned to appreciate the economy of rail haulage for intra-plant movements. With this system one locomotive and one crew can handle many loads in a single train regardless of weather conditions.

The internal combustion locomotive offers many advantages in such service: low fuel cost, one man operation, high availability, no stand-by lossses and no cleaning of fires. Whitcomb locomotives have been demonstrating these savings since 1906 in practically every type of industry.

Whether your problem is light industrial switching or heavy main line transfer service, the Whitcomb line of internal combustion and electric locomotives combined with a complete line of Baldwin steam locomotives, enables us to offer the best type of power for your service.

The Whitcomb Locomotive Company (Plant at Rochelle, Illinois). All sales and engineering by The Baldwin Locomotive Works, Paschall Post Office, Philadelphia, Penna.

Diesel or Gasoline Mechanical
Diesel or Gasoline Electric
Electric Storage Battery
Electric Trolley

WHITCOMB LOCOMOTIVES
SUBSIDIARY OF THE BALDWIN LOCOMOTIVE WORKS

steel has slackened. Recent purchases have reduced active unplaced bridge tonnage in Vermont to approximately 400 tons. The two bridges at Hartford and New London, Conn., will take 12,000 tons each instead of 1200 tons as noted by mistake last week.

Philadelphia — Structural orders are light and except for a 9500-ton bridge in New Jersey, bids July 7, inquiry is featureless.

Buffalo — Activity in structurals has increased further. Of major interest are the first of a number of bridges and viaducts to be built the remainder of the year. Four units up this week involve more than 1200 tons. Two pending school jobs call for 750 tons.

San Francisco—Structural shape lettings aggregated 1159 tons, bringing the year's total to 65,816 tons, compared with 50,138 tons for the corresponding period in 1938.

Shape Contracts Placed

3600 tons, store and office building, for Rockefeller Center Inc., New York, to Bethlehem Steel Co., Bethlehem, Pa.

2400 tons, second crossing, Sacramento river, Delta, Calif., for bureau of reclamation, to Bethlehem Steel Co., Bethlehem, Pa.

870 tons, bridge, sections 12B and 13A, Bedford, Pa., to American Bridge Co., Pittsburgh.

750 tons, incinerator plant, Pittsburgh, for city, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

600 tons, hospital for crippled children, Wilmington, Del., for Nemours Foundation, to American Bridge Co., Pittsburgh.

500 tons, shop-theater-office building, State and Randolph streets, Chicago, to Bethlehem Steel Co., Bethlehem, Pa.

422 tons, bridges, Georgetown, Tex., to Mosher Steel Co., Houston, Tex.

361 tons, bridge, Nacogdoches, Tex., to Bethlehem Steel Co., Bethlehem, Pa.

325 tons, civic center building, Great Falls, Mont., to Minneapolis-Moline Power Implement Co., Minneapolis, Minn.

310 tons, telephone building, Forest Hills, N. Y., to Ingalls Iron Works Co., Birmingham, Ala., through White Construction Co., New York.

295 tons, bridge, Kaufman, Tex., to Mosher Steel Co., Houston, Tex.

295 tons, Nazareth academy, Rochester, N. Y., to F. L. Heughes & Co., Rochester.

265 tons, state bridges, Northeast, Md., to Bethlehem Fabricators, Bethlehem, Pa.

260 tons, destructor plant, Minneapolis, Minn., to Minneapolis-Moline Power Implement Co., that city.

250 tons, state bridge, Stevens Point, Wis., to Milwaukee Bridge Co., Milwaukee.

240 tons, bridge FAP-450-B, Elkton, Md., to Bethlehem Fabricators, Bethlehem, Pa.

235 tons, bureau of reclamation, specification 1217D, item 2, New Mexico, to Thompson Mfg. Co., Denver.

230 tons, Black river bridge, Weathersfield, Vt., American Bridge Co., Pittsburgh.

230 tons, state turnpike commission, Fulton county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

230 tons, redecking, Dodge street bridge, Omaha, Nebr., to Omaha Steel Works, Omaha.

225 tons, addition, Chrysler Motors of California, Los Angeles, to Bethlehem Steel Co., Los Angeles.

205 tons, Fleetwood viaduct, Mount Vernon, N. Y., to American Bridge Co., Pittsburgh, through Bronx Water Works Corp., New York.

200 tons, building, Central Park Realty Corp., New York, to Dreier Structural Steel Co., New York.

200 tons, jail, Washington, for District of Columbia, to Bethlehem Steel Co.,

Shape Awards Compared

	Tons
Week ended June 17	15,598
Week ended June 10	22,416
Week ended June 3	48,113
This week, 1938	31,418
Weekly average, year, 1938	21,566
Weekly average, 1939	23,923
Weekly average, May	23,691
Total to date, 1938	394,180
Total to date, 1939	550,235

Includes awards of 100 tons or more.

FOR RAILROAD *Forgings...*
ERIE HAMMERS AGAIN!

Many leading builders of railroad rolling stock and equipment choose dependable Erie Hammers for turning out forgings of tough texture and rugged strength to meet the rigid specifications Railroads set up for these vital parts...Erie Hammers, because production costs on forgings must be reasonable without sacrificing quality...Erie Hammers, because 36 years' experience in engineering design and craftmanship enable Erie to build hammers on which to produce better forgings at lower cost. It will pay you to read Bulletins No. 325 and No. 328 giving description and specifications on Erie Steam and Board Drop Hammers and Bulletin No. 250 on Erie Trimming Presses.

ERIE FOUNDRY CO.
ERIE, PENNSYLVANIA, U. S. A.

DETROIT 335 Curtis Bldg. CHICAGO 549 Washington Blvd. INDIANAPOLIS 335 Postal Station Bldg
FRANCE Fenwick, S. A. CANADA John Bertram & Sons Co., Ltd. ENGLAND Burton, Griffiths & Co., Ltd.

ERIE BUILDS *Dependable* HAMMERS

Bethlehem, Pa.

200 tons, hospital buildings, Phelps Dodge Corp., Morenci and Douglas, Ariz., to Midwest Steel & Iron Works, Denver.

200 tons, one 200-ton traveling gantry crane, water and power department, Los Angeles, to Harnischfeger Corp., Milwaukee.

195 tons, central heating plant, Rantoul, Ill., to Duffin Iron Works, Chicago.

185 tons, plant addition, Garlock Packing Co., Palmyra, N. Y., to F. L. Heughes & Co., Rochester.

170 tons, home economics building, Lexington, Ky., to Louisville Bridge & Iron Co., Louisville, Ky.

155 tons, auditorium, Beatrice, Neb., St. Joseph Structural Steel Co., St. Joseph, Mo.

150 tons, building, American Cyanamid Co., Kalamazoo, Mich., to Whitehead & Kales, Detroit.

140 tons, Remsen avenue bridge, Los Angeles county, California, for state, to Consolidated Steel Corp., Los Angeles.

125 tons, wharf extension, Iona Island, New York, to Harris Structural Steel Co., New York, through O'Day Construction Co., New York.

125 tons, municipal building, North Tarrytown, N. Y., to Levine Bros. Iron works, New York, through Charles Margotta Co.

125 tons, hospital buildings, Cincinnati, O., for state, to Pittsburgh Bridge & Iron Works, Rochester, Pa.

120 tons, bridge over Canyon creek, Yegen, Mont., for Northern Pacific railway, to American Bridge Co., Pittsburgh.

110 tons, bridge, FAGH-264-B, Eddy county, North Dakota, to American Bridge Co., Pittsburgh.

100 tons, four oil derricks, Union Pacific Railroad Co., Long Beach, Calif., to unnamed interest.

Shape Contracts Pending

9243 tons, superstructure bridge, Raritan river, Sayreville-Woodbridge, N. J., route 35, section 14, involving 29 plate girder steel spans from 84 feet, six inches, to 250 feet, overall 4386 feet; bids July 7, E. Donald Sterner, state highway commissioner, Trenton; work also includes 200 tons of steel castings; 8769 linear feet of railing; 7100 pounds of cast iron castings, and 6100 pounds of structural aluminum.

4500 tons, administration building, municipal center, Washington, for District of Columbia.

1700 tons, steel sheet piling, flood control dike, Holyoke, Mass.; Daniel O'Connell's Sons Co., Holyoke, general contractor.

1500 tons, state bridges, New York; bids June 28, Albany.

1200 tons, state bridge over Scioto river, Chillicothe, O.

820 tons, Coulee dam power house; American Bridge Co. low.

700 tons, two 350-ton overhead traveling cranes, specification 851, Grand Coulee dam, Washington; bids July 10.

608 tons, including machinery, state bridge Snohomish river, Washington; Manson Construction & Engineering Co., Seattle, general contractor.

600 tons, state bridge 5273, Cloquet, Minn.

500 tons, state bridge, Milford, O.

500 tons, state bridge FAGH-8529, Rockville, N. Y.

500 tons, seven state highway bridges, Wisconsin, bids June 20.

475 tons, bridge, Allegheny county, New York; bids June 21.

400 tons, public school No. 18, Buffalo, Metzger Construction Corp., Buffalo, low on general contract.

375 tons, bridges, Somerset county, Pennsylvania, for Pennsylvania turnpike commission.

330 tons, Y. M. C. A., Wilmington, Del.

325 tons, warehouse, for Wamkill Realty Corp., Bronx, New York.

300 tons, bridge, Southern parkway, Queens, N. Y.

300 tons, Fredonia state normal school, Fredonia, N. Y., J. M. Benzinger, Jamestown, N. Y., low on general contract.

300 tons, Southern parkway bridge, Queens, New York.

275 tons, state hospital building, Cleveland.

265 tons, highway bridge, Coinjock, N. C., for army engineers.

265 tons, repairs to bridges, various locations, for Atchison, Topeka & Santa Fe railway.

250 tons, bridge, Hamilton county, New York; bids June 21.

250 tons, state bridge RC-4017, Sebattis, N. Y.

250 tons, bridges, Fulton county, Pennsylvania, for Pennsylvania turnpike commission.

250 tons, viaduct, River avenue, Pittsburgh, for city.

230 tons, bridge, Oswego county, New York; bids June 21.

225 tons, building, for Gardner-Denver

INLAND FLOOR PLATE Gives 4-WAY Protection

1 **INCREASES SAFETY**—The cleated surface gives better, firmer traction in all directions. Accidents are fewer. Traffic moves faster—safely.

2 **SPEEDS PRODUCTION**—men and machines move faster over safe, firm floors.

3 **LASTS LONGER**—No other flooring material compares with rolled steel for strength, toughness and resistance to continuous traffic wear.

4 **CUTS FLOOR MAINTENANCE COSTS**—Inland 4-Way Floor Plate cannot split, chip, roughen. It is easy to clean—reduces maintenance cost to a minimum.

Write for booklet on Inland 4-Way Floor Plate—or order from your distributor

INLAND STEEL CO.

38 South Dearborn Street, Chicago

Sheets • Strip • Tin Plate • Bars • Plates • Floor Plates • Structurals • Piling • Rails • Track Accessories • Reinforcing Bars

Behind the Scenes with STEEL

Thought Provokers

■ Beginning on page 23 of this issue is the third successive lead article appearing in STEEL of such penetrating interest to every thinking man in business that we urge you to make sure you and your associates read them without fail. Senator Tyding's address in the June 5 issue has created such interest that thousands of reprints have already gone out from this office with orders still piling up. Pittsburgh editor Hartford's study of steel's present technical and financial position in the June 12 issue has been widely received as an excellent reflection of the industry's status and provoked favorable comment from top men the country over. And now, it is agreed by everyone with whom we've talked, Walter Lippman, in his masterful article on The American Destiny does more to clarify the nation's thinking (and each of ours individually) than anything yet written. If you do nothing else today, read The American Destiny.

Star Reporter

■ A couple of weeks ago we told you (or tried to) all about the 63rd Annual bull fight, ox roast, and Wintersteen birthday party. With blushing shame we now learn that aside from the title given Mr. Wintersteen, the road with which he is connected, the ownership of the Cornwall & Lebanon railroad; and the fact there were no live bulls present, our story was correct in every respect, namely that there was a Wintersteen birthday party in Lebanon. (Or was it Oshkosh?)

Over Our Head

■ Snooping around behind the editorial scenes last week we snooped right into a battle royal on whether the unit for moment of turning or torque is the "pound - foot," "pound - inch," "ounce-inch," etc. in distinction to "foot-pound," "inch-pound," etc. used for units of work. It all centered around a news release in which the company had brazenly (so one battler thought) used foot-pounds for torque. School books for the ash can, said they, and shoved out for contrary evidence a pile of engineering handbooks actually used in practice. About this time we heard mamma calling us and ducked out. It all made about as much sense to us as the threat to break up the Yankees because they're too good.

With Plenty of Brass

■ From the May issue of the *Highway* magazine comes a definition of a dictator we should have thought of ourselves long ago: *An iron man on a steal job.*

Gourmet's Delight

■ Apparently we started something by tagging the Smithville, Ohio Inn as the *largest, most famous* and *best* chicken dinner house in America. Readers with an avocation for home-style chicken dinners seem to doubt our word slightly but we still say their slogan is a gross understatement.

Shovel-Leaning

■ With no intention of turning this little patch of ours into a lecture hall, nor with any loss of love for a good W. P. A. story, we still like this beginning of a sales letter just received: "It is altogether possible that the gibes at W. P. A. are neither just nor funny but even were they so, it is not there alone that shovel-leaning is done. American business also has its shovels on which at times it leans. One of the worst shovels on which business is tempted to lean is the expectation of an 'upturn next autumn, sometime.' Upturns are created, they don't just happen." And again we say, turn back to page 23 and let Mr. Lippman paint his picture for you.

SHRDLU

Corp., Quincy, Ill.

215 tons, buildings, Quincy, Mass., for Procter & Gamble Co.

200 tons, grade crossing elimination, Buffalo; bids June 19.

170 tons, leanto, etc., specification 9010, Philadelphia, for U. S. navy.

160 tons, state bridge, route 5, section 40, New Jersey; bids June 23.

145 tons, department of public works, Chicago.

135 tons, state highway bridge, Petersburg, Ill., bids in.

133 tons, two-span steel truss bridge, overall length 234 feet, gravel approaches, Hoosic river, North Pownal, Vt.; bids June 23, H. E. Sargent, commissioner of highways, Montpelier.

110 tons, building, for Times Square Terminal Inc., New York.

Unstated, ten 133-foot steel towers and prefabricated steel frame buildings; bids in to Civil Aeronautics authority, Washington.

Reinforcing

Reinforcing Bar Prices, Page 83

Pittsburgh—Reinforcing bar tonnages are coming out in good volume and there is no apparent letup in sight. Placements are slightly slower but most current tonnage is for additions to projects already under way, with the lag between inquiry and placement not long. Speed of placement has been moved up in some sections by price weaknesses, notably in the East.

Chicago — Pending business continues heavy, the largest single item being 3300 to 3800 tons for a subway section to be bid June 29. Prospective orders include unstated tonnages for several buildings for Northwestern university. Awards are headed by 1700 tons for a Gary, Ind., sewage disposal plant.

Boston—Reinforcing steel buying has slackened, and inquiry is also less active. Awards include close to 300 tons for highways in Rhode Island and Connecticut is taking bids on several contracts, bridges and roads, requiring close to 500 tons.

New York — Reinforcing bar prices are slightly steadier and shading is less drastic. Buying has de-

Concrete Bars Compared

	Tons
Week ended June 17	**8,837**
Week ended June 10	**8,009**
Week ended June 3	**7,395**
This week, 1938	**3,039**
Weekly average, year, 1938	**6,959**
Weekly average, 1939	**10,281**
Weekly average, May	**9,743**
Total to date, 1938	**133,350**
Total to date, 1939	**246,475**

Includes awards of 100 tons or more.

clined, also new inquiry although several thousand tons of active unplaced tonnage pends.

Philadelphia—Bids will be opened June 20 by the Pennsylvania turnpike commission on the first paving contract for its 150-mile program for surfacing the superhighway between Pittsburgh and Harrisburg. The initial contract covers ten miles and will require 600 tons of reinforcing steel.

Seattle — Recent awards have given mills a fair backlog but no large tonnages are pending. The most important project is tower foundations for Bonneville authority, bids at Portland, June 15, tonnages unstated. Mill prices are unsteady and weak. Merchant bars show no improvement.

San Francisco — The only reinforcing bar award of over 100 tons went to Ceco Steel Products Corp., 130 tons for a warehouse in San Francisco for Best Foods Inc. Awards totaled only 440 tons and brought the aggregate to date to 78,865 tons, compared with 45,904 tons for the same period last year.

Reinforcing Steel Awards

1700 tons, sewage disposal plant, Gary, Ind., to Carnegie-Illinois Steel Corp., Chicago.

1000 tons, housing development (colored), Louisville, Ky., to Truscon Steel Co., Youngstown, O.; Struck Construction Co., contractor.

750 tons, Ballard bridge, Seattle, to Northwest Steel Rolling Mills, Seattle.

700 tons, apartments, municipal housing authority, Yonkers, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; Psaty & Fuhrman, contractors.

700 tons, viaduct, Brooklyn, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; P. T. Cox Construction Co., New York, general contractor.

577 tons, section 13B, Pennsylvania turnpike, Bedford county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.; York Engineering & Construction Co., contractor.

550 tons, sewage disposal plant, Springfield, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Caye Construction Co., contractor.

500 tons, Ray's hill tunnel, Pennsylvania turnpike, to Jones & Laughlin Steel Corp., Pittsburgh; Mason & Hanger, contractors.

500 tons, two bridges in Fulton county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

300 tons, additional award for power station, Oswego, N. Y., by Central New York Power Corp., to Truscon Steel Co., Buffalo.

300 tons, elevator, Quaker Oats Co., Akron, O., to Joseph T. Ryerson & Son Inc., Chicago; Alskog Co., contractor.

270 tons, section 13C, Pennsylvania turnpike, Snake Spring township, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.; York Engineering & Construction Co., contractor.

200 tons, paving, Shore and Southern parkways, Queens, N. Y., equally divided between Concrete Steel Co., New York, and Truscon Steel Co., Youngstown, O.; Garafano Construction Co., New York, general contractor.

200 tons, Nemours Foundation hospital, Wilmington, Del., to Republic Steel Corp., Cleveland; through Concrete Steel Co., George A. Fuller Co., contractor.

175 tons, Negley Run sewer, Pittsburgh, to Jones & Laughlin Steel Corp., Pittsburgh; Parkview Construction Co., Pittsburgh, contractor.

150 tons, Raccoon creek bridge, New Jersey, to Truscon Steel Co., Youngstown, O.; Francis A. Conuso & Sons, Philadelphia, general contractor.

135 tons, two bridges, Somerset county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

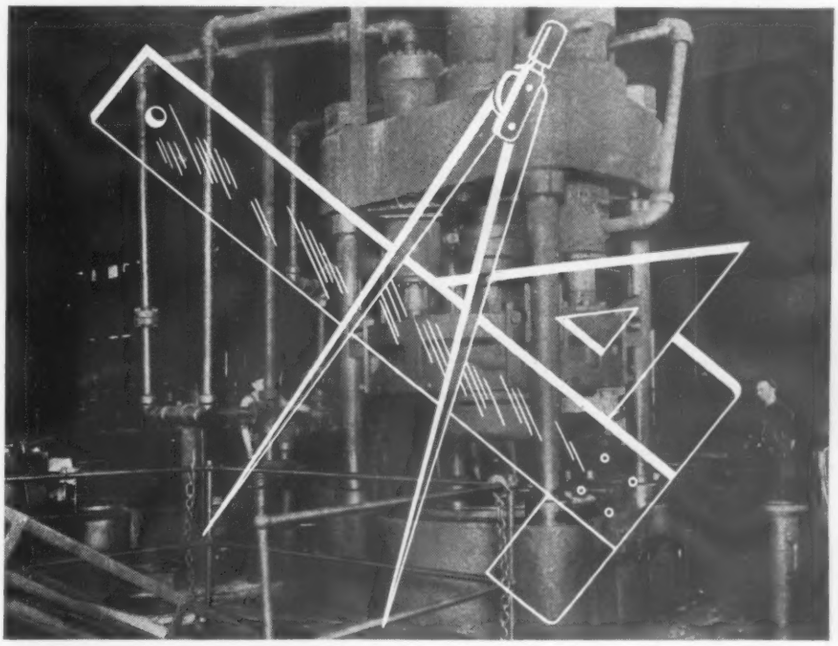
130 tons, warehouse, Best Foods Inc., San Francisco, to Ceco Steel Products Corp., San Francisco.

Reinforcing Steel Pending

2100 tons, building, New England Mutual Life Insurance Co., Boston.

1485 tons, barracks, mess hall and galleys, naval air station, Alameda, Calif.; bids opened.

1100 tons, flood control dike, Holyoke,



Hackney's FACILITIES HELP MAKE PROFIT CURVES GO HIGHER

Many manufacturers have reduced costs, saved time and obtained increased efficiency by utilizing Hackney's unique designing, engineering and manufacturing facilities.

Special shapes and shells, produced by the Hackney method, are backed by more than 35 years of development and construction experience. The cold-drawing of seamless containers from numerous types of metal plates was pioneered by the Pressed Steel Tank Company. And Hackney welding is recognized as being superior. Hackney procedures permit the production of better, more dependable products at lower cost.

Let Hackney engineers work with you in developing new shapes or containers to meet your particular problems or in improving the product you are now using. Send the details or ask to have an engineer call. There is no obligation. Write today.

PRESSED STEEL TANK COMPANY

208 S. La Salle St., Rm. 1211, CHICAGO
688 Roosevelt Building, LOS ANGELES
1387 Vanderbilt Concourse Bldg., NEW YORK
1461 S. 66th Street, MILWAUKEE

DEEP DRAWN SHELLS AND SHAPES

Mass., Daniel O'Connell's Sons Co., Holyoke, general contractor.

1000 tons, plant extension, Washburn-Crosby Co., Buffalo; bids June 12.

775 tons, soap factory, Procter & Gamble Co., Quincy, Mass.

693 tons, western regional laboratory, Albany, Calif.; general contract to MacDonald & Kahn Inc., Financial Center building, San Francisco.

525 tons, highway projects, New York state; bids June 28, Albany.

500 tons, soy bean elevator, Glidden Co., Chicago.

250 tons, Four Mile run drainage basin, Pittsburgh; Mead Construction Co., contractors.

250 tons, approaches to Snohomish river bridge, Snohomish county, Washington; bids June 27.

225 tons, River front boulevard, contract 4, Pittsburgh.

200 tons, bridge and grade separation, Saginaw, Mich.

200 tons, public school No. 18, Buffalo, Metzger Construction Corp., Buffalo, low on general contract.

150 tons, foundations, fuel oil tanks, Bayone, N. J.; Graves & Quinn, New York, general contractors.

125 tons, state crossing, Tacoma, Wash.; bids to Olympia, June 27.

109 tons, paving and three bridges, Winchester, Conn.

100 tons, Washington state highway projects; Manson Construction Co., Seattle, general contractor.

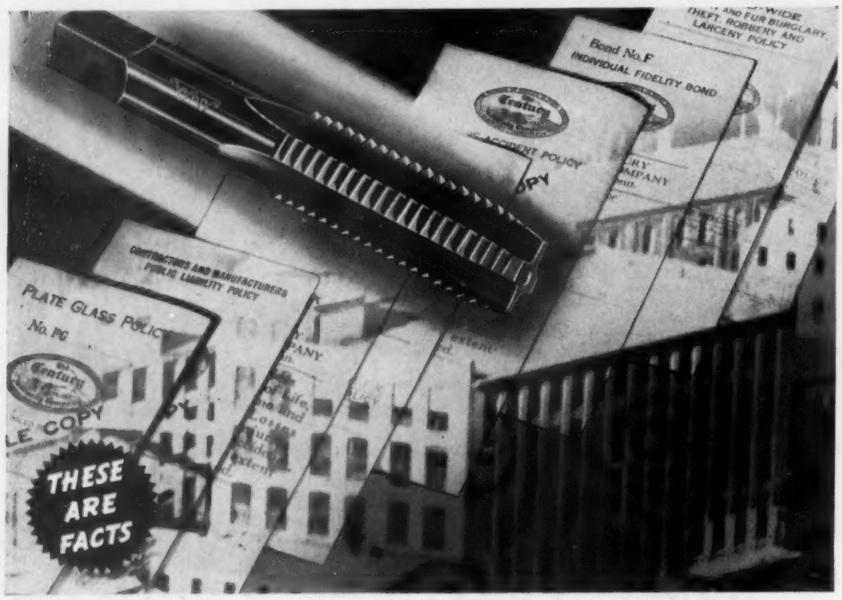
100 tons, Fredonia state normal school, Fredonia, N. Y., J. M. Benzinger, Jamestown, N. Y., low on general contract.

Unstated, state spans at Bend and over Illinois river, Oregon; bids to highway commission, Portland, June 22.

Ferroalloys

Ferroalloy Prices, Page 84

New York — Prices of ferromanganese and other leading ferroalloys have been reaffirmed for third quarter. Current market for the former of $80, Atlantic and Gulf ports, has prevailed since the middle of January.



INSURED against Production Loss, too

" 'Maxi' taps turned out to be real insurance against production loss," writes this Pennsylvania Manufacturer.

"We were tapping seamless steel tubing. Our best previous record was 80 holes per tap. With a 'Maxi' tap we threaded 1200 holes, and as far as we could see the tap showed absolutely no signs of wear."

"Maxi" taps insure against loss on tool costs and production time. Their special surface treatment has been developed by "*Greenfield*" to meet modern requirements. Identify them by their jet black finish.

GREENFIELD TAP & DIE CORPORATION, GREENFIELD, MASSACHUSETTS
Detroit Plant: 2102 West Fort St.—Warehouses in New York, Chicago, Los Angeles and San Francisco.
In Canada: Greenfield Tap & Die Corporation of Canada, Ltd., Galt, Ontario

GREENFIELD

"GREENFIELD" TAPS DIES · DRILLS SCREW PLATES PIPE TOOLS REAMERS GAGES — SOLD BY DISTRIBUTORS EVERYWHERE

Pig Iron

Pig Iron Prices, Page 84

Cleveland—Variations in deliveries so far this month compared with May are small. Consumption is off slightly in some directions. Stove plants are less active, but some makers of heating equipment continue busy. Iron shipments to automotive areas have been stimulated by ending of the Briggs strike. Prices are reported steady on new business.

Chicago — Shipments are slower, now running behind May about 15 per cent. Declining requirements of automotive and agricultural interests are seen as chiefly responsible. A slight bulge in sales has been noted since opening of books for third quarter delivery at a continued price of $21. Buying is still spotty.

Boston—Demand is slightly heavier, but the foundry melt shows little gain. Only a small tonnage has been booked for third quarter delivery, and spot buying also is light.

New York—With a number of foundries planning vacation and inventory shutdowns July 1, pig iron is being bought sparingly. Heating equipment manufacturers are fairly active in acquiring stocks of finished parts for the fall market. A few export inquiries are pending, largely for Scandinavian countries.

Philadelphia — Pig iron specifications are tapering as the inventory and vacation season approaches. A number of melters plan to close the July 4 week.

Buffalo—Shipments have moderated slightly, following a small pick-up early this month. The setback is attributed to no one industry. Melters are averaging three days a week, with iron purchases covering only early needs. Eight of 14 blast furnaces are active.

Cincinnati—Shipments are close to the May rate. Operations of jobbing foundries are sustained, but production of stove, automobile parts and farm equipment castings has receded. Most new pig iron business is in small lots for prompt delivery, although sellers have opened third quarter books at unchanged prices.

St. Louis — Pig iron releases are heaviest from jobbing foundries, releases from farm implement and stove plants being lighter. Total movement is off materially since a month ago. Little interest is shown

in contracting, new business being limited to spot orders.

Birmingham, Ala.—Thirteen blast furnaces are producing. These include seven for the Tennessee company and two each for Sloss, Republic and Woodward, unchanged from last week.

Toronto, Ont.—Sales are steady and are coming principally from smaller consumers. Most of the larger melters are covered for the present. Consumption and production are unchanged.

Scrap

Scrap Prices, Page 86

Pittsburgh—Scrap prices continue firm, with little No. 1 steel available and demand relatively light. Orders have appeared from several points, but there is no undue pressure for delivery. While scrap is coming out steadily, brokers are covering on small margin in some cases.

Cleveland—Little scrap is moving and many grades are scarce. Since tonnages are being shipped outside on contracts but little buying is being done. Prices on some specialties have been advanced 25 to 50 cents, particularly cast grades.

Chicago — No. 1 heavy melting steel is off 25 cents, with several other grades also moderately lower. Scrap is coming out more freely than a month ago, with No. 1 steel reported offered by dealers as low as $13.

Boston — Domestic prices are mixed, machine turnings and bundled skeleton being slightly firmer while breakable cast is easier.

New York—Buying for export is steady but not above the normal rate, at unchanged prices. Domestic buying is light, eastern mills taking scattered small shipments and in some instances shipments are held up. Comparatively little tonnage is going from New York to eastern Pennsylvania. Foundry grades are slow. Domestic prices are unchanged, undoubtedly maintained in part by export quotations.

European cartel has bought additional scrap, including steel and cast grades. Negotiations continue for further tonnage which may come close to 600,000 tons. This follows purchase of about 350,000 tons two months ago. Prices paid are said to be $15 for No. 1 and $13.50 for No. 2, the same as on the last sale.

Philadelphia — Prices continue strong, due to export activity. Domestic consumers show little interest in the market. Heavy breakable cast is easier, but certain specialties are higher. Scrap exports, which fell markedly in May, are expected to rebound to the April level this month.

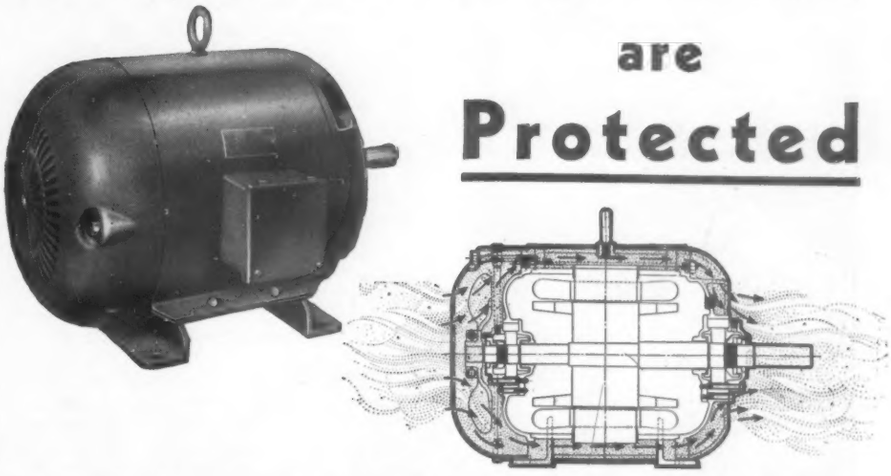
Buffalo—Mills are resisting higher scrap prices and are curtailing receipts against old orders, but dealers continue bullish. Sentiment is bolstered largely by higher prices in other districts. Steelworks report ample supplies on hand for early needs.

Detroit—Scrap has advanced 50 to 75 cents a ton, largely in sympathy with the trend in other districts. Scrap is coming out slowly, but major consumers are comfortably supplied for the next 60 days, if not longer. Brokers are somewhat disinclined to share the optimism of dealers.

Cincinnati — Prices are up 50 cents, although market activity has increased only moderately. Scrap movement is heavier, reflecting recent improvement in steelmaking. Demand for foundry grades is unchanged, but prices on all items have advanced.

St. Louis — Sale of several thousand tons of heavy melting steel to an east side mill is the only out-

Wagner CP Motors are Protected



Motor Maintenance is reduced to a minimum where Wagner type CP totally-enclosed fan-cooled motors are used, because Wagner CP motors are protected against the entrance of dust, filings, fumes, moisture, and other agents that are destructive to open-type motors.

Ask for this Valuable Bulletin

For complete information on Wagner type CP motors write for Bulletin 182. If you have anything to do with the selection, operation, or maintenance of motors, you should have a copy of this valuable bulletin. It's free—no obligations.

The use of open-type motors in dust-laden atmospheres means frequent shut-downs for cleaning and repairing. Shut-downs are costly—in two ways. Not only the actual cost of motor maintenance, but also the loss of production time must be considered.

The reason why Wagner CP motors can operate continuously under conditions which cause trouble with open-type motors is that they are built with two frames, an outer frame which guides a strong cooling draft over the motor, and an inner frame which completely seals the vital parts of the motor against the entrance of destructive agents.

Protect yourself against excessive motor maintenance and unnecessary shut-downs by standardizing on Wagner type CP motors.

M39-16

Wagner Electric Corporation
6400 Plymouth Avenue, Saint Louis, U.S.A.
MOTORS TRANSFORMERS FANS BRAKES

standing transaction in the market. The material brought $11.50, unchanged from the last purchase by this interest. Mills generally are well supplied. Offerings continue moderate.

Birmingham, Ala.—Scrap is quiet, both sales and inquiries being scarce.

Seattle—Mill buying is fair, $12 and $11 being paid for No. 1 and No. 2, respectively. The export market is quiet, Japan placing small orders. In spite of small demand from the Orient, local export prices continue firm at $14 and $14.50. Tidewater stocks are generally low, receipts from the interior being under normal levels.

Toronto, Ont.—Most scrap prices are firm, and a reflection of the higher market in the United States is looked for here, but stove plate is off another $1 a ton. Machinery cast is more active, but steelmaking grades are quiet in new business. A local pipe foundry which recently resumed operations is in the market for cast scrap.

Warehouse

Warehouse Prices, Page 85

Cleveland—Most warehouses note little change in sales since a month ago. Some machinery builders are more active, this being reflected in better bar demand lately.

Chicago—Sales were up slightly last week and also somewhat heavier than a month ago. Some seasonal slowing down is expected near the end of June, but absence of a major letdown at this time is encouraging to warehouses.

Boston—Volume is close to the May rate, recent price revisions having stimulated demand for some products. Heavy items are relatively slow.

New York—Warehouse demand has slackened slightly. Orders continue numerous, but tonnage is down. Specialties make relatively the best showing. Recently adjusted prices are generally maintained except for usual scattered shading.

Buffalo—Business is steady or a trifle better compared with a month ago. Demand is well diversified. Prices are steadier.

Cincinnati—Sales are well sustained. Resumption of coal mining has aided demand, but inquiries for building materials are disappointing.

St. Louis—Business is slightly heavier. Small shapes and tubular products for building work are more active and rural demand is slightly heavier.

Seattle—Volume is about the same as a month ago but the market is developing signs of seasonal lethargy. Prices continue unstable. Portland dealers are generally maintaining their price lists.

Steel in Europe

Foreign Steel Prices, Page 85

London—(*By Cable*)—Middlesbrough pig iron market is quieter but many contracts are being booked to the end of the year. Foundry iron sales in Great Britain continue dull. Steel producers and rerollers continue to operate at capacity. American scrap and Continental and Australian semifinished steel are relieving the situation.

Steel ingot and castings production in May was 1,218,100 gross tons, an alltime record, compared with 1,058,200 tons in April. Pig iron production in May was 692,100 tons, compared with 608,900 tons in April.

British foreign trade increased sharply in May, imports totaling 142,612 gross tons, a gain of 50,978 tons over 91,634 tons in April. Much of the increase may be attributed to increased tonnage of semifinished steel from the Continent and galvanized sheets from America and other sources. Exports amounted to 168,513, an increase of 22,457 tons over 146,056 tons in April.

The Continent reports export trade is active, with indications good for large British orders for semifinished steel. Holland and Scandinavia are buying ship plates.

Iron Ore

Iron Ore Prices, Page 86

New York—Chinese wolframite is easier on recent offerings as low as $17.50 to $18 per short ton unit, duty paid. Demand is light. Weakness is attributed to temporary withdrawal of Germany and Russia from the market, following recent stocking. Domestic scheelite, however, is relatively steadier. Outstanding in an otherwise sluggish market is the sale here of about 8000 tons of North African low phosphorus iron ore. Price was not revealed, but the market generally has been around 12 cents per unit. Imported fluorspar is easier at $21.50 for 85-5 material, a decline of 50 cents.

Coke Oven By-Products

Coke By-Product Prices, Page 83

New York—Distillate prices are unchanged with current reduced production moving directly into consumption, supplies of benzol being taken by the chemical rubber and

fuel consumers in steady volume. Paint, varnish and lacquer users absorb a good part of toluol and xylol production. Phenol buying is steady with prices unchanged. Naphthalene volume has declined, notably with jobbers, the household season having ended. Announcement is expected late this month on next season's sulphate of ammonia contracts.

Nonferrous Metals

New York—Heightened tension in the Far East and Central Europe last week threw a bearish note into the nonferrous metal markets. Sales and shipments held at fairly good levels but expected increases failed to materialize as the trade stood aside pending developments.

Copper—Recovery of export prices early in the week was offset near the close with foreign buyers generally marking time. Domestic business also declined and the price of electrolytic copper held unchanged at 10.00c, Connecticut. Nevertheless, leaders in the industry looked for gradual improvement over the next few months.

Lead—Sales of domestic lead remain at the level of about 10,000 tons weekly despite price fluctuations in London. An advance of $1 a ton was made at midweek by leading domestic sellers, bringing prices here to 4.80c, New York, and 4.65c, St. Louis. Buying was stimulated only slightly by the advance.

Zinc—Continued decline of the galvanizing rate was not reflected in the week's zinc sales, but other factors, chiefly seasonal, brought the tonnage to about half the previous week's total. Prime western zinc held without change at 4.50c, East St. Louis, the price at which it has stood since Nov. 29, 1938.

Tin—Political and military developments in South China were regarded in the trade as a strengthening rather than a weakening factor for tin. Increase in the third quarter export quota to 45 per cent of standard tonnages, made by the International Tin committee last week, apparently was discounted in advance, pricewise.

Ore Imports Steady

Baltimore — Five shipments of iron ore arrived here from May 24 to June 3. These were 21,800 tons from Cruz Grande, Chile, May 27; 21,500 tons, Cruz Grande, Chile, May 30; 7741 tons, Narvik, Sweden, June 1; 22,500 tons, Cruz Grande, Chile, June 2; and 10,500 tons, Daiqairi, June 3.

Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound.

June	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
10	10.00	10.00	9.62½	48.35	48.05	4.75	4.60	4.50	20.00	12.00	35.00
12	10.00	10.00	9.62½	48.25	48.00	4.75	4.60	4.50	20.00	12.00	35.00
13	10.00	10.00	9.62½	48.35	48.15	4.75	4.60	4.50	20.00	12.00	35.00
14	10.00	10.00	9.62½	48.75	48.55	4.80	4.65	4.50	20.00	12.00	35.00
15	10.00	10.00	9.62½	48.75	48.55	4.80	4.65	4.50	20.00	12.00	35.00
16	10.00	10.00	9.62½	48.75	48.55	4.80	4.65	4.50	20.00	12.00	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 10.00c Conn. copper

Sheets

Yellow brass (high) 16.48
Copper, hot rolled 18.12
Lead, cut to jobbers 8.00
Zinc, 100 lb. base 9.75

Tubes

High yellow brass 19.23
Seamless copper 18.62

Rods

High yellow brass 11.85
Copper, hot rolled 14.62

Anodes

Copper, untrimmed 15.37

Wire

Yellow brass (high) 16.73

OLD METALS

Nom. Del. Buying Prices

No. 1 Composition Red Brass

New York 5.75-6.00
Cleveland 6.50-6.75
Chicago 5.75-6.00
St. Louis 6.00-6.25

Heavy Copper and Wire

New York, No. 1 ..... 7.75-7.87½
Cleveland, No. 1 ..... 7.50-7.75
Chicago, No. 1 ..... 7.37½-7.62½
St. Louis 7.50-7.75

Composition Brass Borings

New York 5.00-5.25

Light Copper

New York 6.25-6.50
Cleveland 5.75-6.00
Chicago 5.75-6.00
St. Louis 6.00-6.25

Light Brass

Cleveland 3.50-3.75
Chicago 3.87½-4.12½
St. Louis 3.50-3.75

Lead

New York 4.00-4.25
Cleveland 3.50-3.75
Chicago 3.50-3.75
St. Louis 3.50-3.75

Zinc

New York 2.50-2.62½
Cleveland 2.00-2.25
St. Louis 2.25-2.50

Aluminum

Borings, Cleveland 5.75-6.00
Mixed, cast, Cleveland 7.75-8.00
Clips, soft, Cleveland 13.75-14.00
Misc. cast, St. Louis 7.00-7.25

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads .. 10.25
Standard No. 12 aluminum 12.00-12.25

TOWMOTOR CLEVELAND

UNLOADS BOX CAR IN 30 MINUTES

In warehousing tin plate in Pittsburgh, a single TOWMOTOR Lift Truck cut handling costs over 50%. Machine unloads average 40 ton box car of tin plate in half an hour. Write for new bulletin of action pictures today.

TOWMOTOR CO.
1247 East 152nd St.
Cleveland, Ohio

Sales Offices in 22 Principal Cities

PIONEERS OF STRAIGHT GAS POWER AND SEATED CENTER CONTROL FOR 10 YEARS.

May Ore Imports Off

Baltimore—Iron ore importations here in May aggregated 178,476 tons, against 184,670 tons in April and 141,349 tons a year ago. May imports bring the total for the first five months up to 915,085 tons, with March the outstanding month so far, with a total of 199,088 tons. For first five months last year iron ore arrivals totaled 763,484 tons.

Manganese ore importations in May of 39,860 tons were the largest to date, surpassing slightly the 39,270 tons brought in in January. It compared with 20,161 tons in April and 24,380 tons a year ago and brought the total for the first five months up to 131,204 tons, against 196,223 tons in the corresponding period last year.

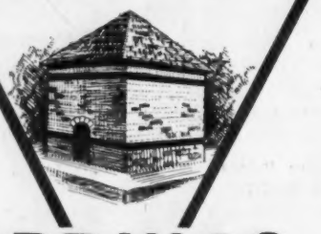
Chrome ore importations in May also exceeded arrivals in any preceding month, totaling 9418 as against 6880 tons in April, the second highest total, and 5800 tons in January, the third highest. In May, 1938, 14,259 tons were received. Arrivals for the first five months totaled 25,708 tons, against 73,816 tons in the same period last year.

Ferromanganese shipments last month totaled 924 tons plus 472 barrels. Pyritis importations totaled 20,933 tons, against 13,193 tons in the preceding month, 13,050 in March, 14,826 in February and 6983 in January. Magnesite shipments comprised 5368 tons plus 20 drums. Eighty-six tons of kyamite ore also came in.

Philadelphia—Shipments received here during the week ending June 10 included 6012 tons of chrome ore from Cuba, 548 tons of pig iron from the Netherlands and 22 tons of wire rods and five tons of steel billets from Sweden.

FORT PITT SPRINGS

• For Heavy Duty Service
• Coil and Elliptic Springs
• Special Shapes and Spring Steel
• Alloy Springs a Specialty
• Large or Small
• We Serve Industry as well as Railroad Needs



Write for free Catalog and Specifications Sheets

FORT PITT SPRING COMPANY

P. O. BOX 1377, PITTSBURGH, PA.
Works—John Street, McKees Rocks, Pa.

STRONG STEEL CASTINGS

Acid Open-Hearth Steel

....From 1 Lb. to 30,000 Lbs.

STRONG STEEL FOUNDRY CO.
BUFFALO, N.Y.

Equipment

New York—Purchases of machine tools by domestic users are well maintained with slight gains reported by some dealers. Another list for export is expected out shortly for Russia. Orders are still for one or two tools at a time, but the type of business is well distributed, industrial activity being confined almost entirely to replacements. Additional purchases by at least one shipyard in the East are expected. Most builders have substantial backlogs, reflected in deliveries up to 20 weeks in some lines. June shipments will probably top May.

Chicago—One leading machinery interest reports bookings 20 per cent ahead of same period in May. Demand from Detroit district is particularly improved. Some railroad buying is evident, although general purchasing covers a broad range of interests. Dark spot in present picture is a slowing up of active inquiries. Machinery interests believe June will turn out better than May, unless the last week or ten days of the month bog down more than expected.

Seattle—Important seasonal lettings have been made and demand for machinery and equipment has eased. Federal and municipal requirements are heavier than demand from industrial sources where replacements are confined to immediate needs. Jenkins Bros., Bridgeport, Conn. are low at $8557 to Denver for furnishing by-pass and air piping for the Coulee pumping plant and Hardesty Mfg. Co., Denver, is low at $11,880 for furnishing pipe fittings and appurtenances for the same project.

Heading Specialists

Economy-minded buyers of made-to-order screws and headed parts are discovering real savings in PROGRESSIVE cold upset products. They have found that many parts now milled from the bar can be headed efficiently and accurately with our modern equipment — at reduced costs. We invite you to submit samples or outline ideas to our specialists. Their advice — intelligently and promptly given — may show you the way to greater fastening economies.

QUALITY PROMCO BRAND

The PROGRESSIVE MFG. CO.
TORRINGTON · · · CONNECTICUT

CHEMICALS ACP PROCESSES

PREVENT OVER-PICKLING and WASTE OF ACID

USE **RODINE**

AMERICAN CHEMICAL PAINT CO.
AMBLER PENNSYLVANIA
Detroit, 6339 Palmer Ave., E. • Canadian Branch, Walkerville, Ont.

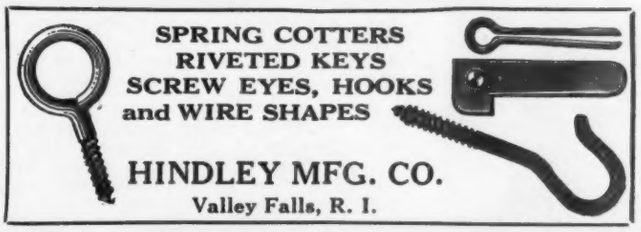
DESIGNING AND COMBUSTION ENGINEERS
SPECIALIZING IN
OPEN HEARTH FURNACES

LOFTUS ENGINEERING Corporation

509 OLIVER BLDG. PITTSBURGH, PA.
TELEPHONE ATLANTIC 4480

Fuel Conservation Experts

SPRING COTTERS
RIVETED KEYS
SCREW EYES, HOOKS
and WIRE SHAPES



HINDLEY MFG. CO.
Valley Falls, R. I.

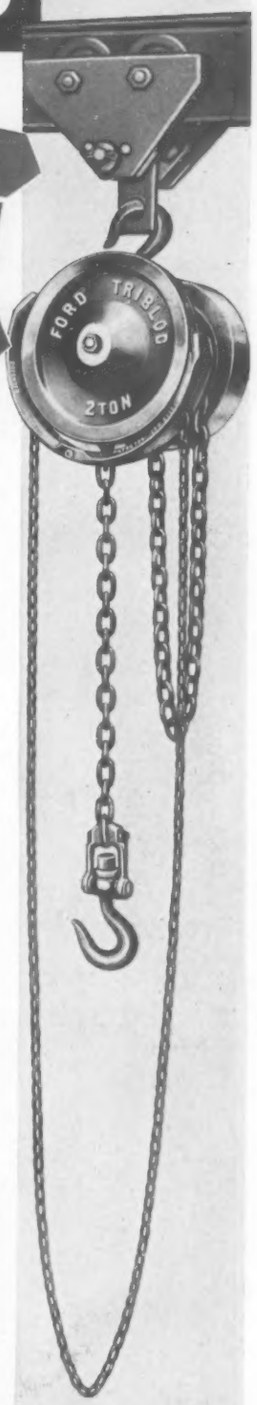
LOCOMOTIVE CRANES
CRAWLER CRANES
SHOVELS

OHIO

THE OHIO LOCOMOTIVE CRANE CO.
BUCYRUS, OHIO

FORD TRIBLOCS

for SPEED DURABILITY ECONOMY



● You can speed up many hoisting jobs—and handle these jobs more economically. You can have these advantages at a very reasonable price.

Ford Triblocs are fast and powerful. They are easy to operate. They are strongly built to give long, trouble-free service.

Ford Triblocs are of spur gear construction. They are made of finest malleable castings of certified grade, and of high quality drop forgings. They are equipped with high-carbon heat-treated chain of great tensile strength and high elastic limit.

These efficient hoists are recommended for practically any application in which there is need for a hoist of 1/4- to 40-ton capacity.

BUY ACCO QUALITY *in Ford Triblocs and other Ford Hoists—and in Page Welding Electrodes, Tru-Lay Preformed Wire Rope, Reading-Pratt & Cady Valves, Campbell Abrasive Cutting Machines, American Welded and Weldless Chains.*

Order from your distributor

TRADE MARK

FORD CHAIN BLOCK DIVISION
PHILADELPHIA, PENNSYLVANIA
See our exhibit, Metals Building, New York World's Fair

AMERICAN CHAIN & CABLE COMPANY, Inc.
In Business for Your Safety

Construction and Enterprise

Ohio

BRYAN, O.—Village, C. F. Hester, clerk, will probably issue mortgage bonds to finance purchase of a 3000-horsepower diesel engine and appurtenances costing about $150,000 for installation in its power plant. Will mature in fall. (Noted May 29.)

MANSFIELD, O.—Tappan Stove Co. plans to erect a complete enameling plant, one-story, costing $100,000 with equipment.

MIDDLETOWN, O. — City, Walter Braun, manager, has authorized purchase of a site for its projected new municipal light and power plant to cost $2,466,000. Consulting engineer, Froehlich & Emery Engineering Co., Toledo, O.

SOUTH BOULEVARDS, O.—Village, Dr. C. W. Frickman, mayor, is starting survey and will apply to WPA for aid in projected construction of a sewerage system and sewage treatment plant costing about $75,000. North-Central Ohio Engineering Co., Mansfield, O., consultant.

WEST MILTON, O.—Village, Marshall Walker, mayor, will vote July 14 on proposal to issue bonds to finance waterworks improvements costing $30,000. Includes 100,000-gallon storage tank, purification plant and water softener. Collins Wight, Dayton, O., engineer.

WILLARD, O.—Village, Ernest Wolff, mayor, is taking bids due at noon, June 24, on installing a new 1500-kilowatt steam turbine generating unit complete with appurtenances, and a new steam condenser. Total cost is not to exceed $87,000. F. N. Straus, Cleveland, consultant. (Noted May 15.)

ACCURACY

Kidd's Micrometer Agrees with Yours

Specializing for 41 years in the production of *drill rods* and cold drawn steels enables us to provide you with the best of material—accurately drawn and heat treated—carefully inspected and smoothly finished.

An "efficiency" product.

—Also regular and special shapes for all purposes.

Send for the chart of decimal equivalents. It's yours for the asking.

KIDD DRAWN STEEL CO.

Aliquippa, Pa.

(Pittsburgh District) *Phone: Aliquippa, 196*

Lee Conveyor SCREWS
are helically coiled bands of metal pitched to requirements, for welding to a shaft. Light in weight; great in strength, toughness and adaptability, they make a preferred method of constructing helical conveyor screws. Promptly available in low carbon steel for all ordinary applications or in 16-18% chrome steel for resistance to corrosion and abrasion. Other metals also available. You are invited to look into the possibilities of this preferred conveyor screw.
Write for Folder
Lee SPRING CO., INC.
30 MAIN STREET BROOKLYN N Y

Connecticut

STAMFORD, CONN.—City is completing plans for a sewerage system and pumping station costing approximately $245,000. L. E. Tuttle, city engineer.

New York

BINGHAMTON, N. Y.—City is receiving bids on contract 5 for improvements to its filter plant at estimated cost of $110,000. Part of WPA project.

BUFFALO—Worthington Pump & Machinery Corp. has awarded to H. F. Stimm Inc., Ellicott Square building, Buffalo, a contract for building a 36 x 176-foot addition to its plant.

BUFFALO—Fisher Body division of General Motors Corp., Detroit, is drawing plans for an addition to its assembly plant here.

OSWEGO, N. Y.—Texas Petroleum Co., New York, will soon take bids for a laboratory estimated to cost $150,000. Ballinger Co., Philadelphia, engineer.

Pennsylvania

CHESTER, PA.—Scott Paper Co., Edward S. Wagner, treasurer, has broken ground for the first unit in a $1,500,000 plant expansion program. Project includes a new papermaking machine with auxiliaries and finishing equipment.

NORTH GIRARD, PA.—Boro has plans for sewers and sewage disposal plant, including tanks, pumps and filters, at total cost of $208,600. To mature soon. Hill & Hill, North Girard, consulting engineers.

Michigan

JACKSON, MICH. — State, Grover C. Dillman, budget director, Lansing, Mich., is receiving bids until 2 p. m., June 27, for power plant equipment to be installed in the state prison here. Involves coal burners and related boiler equipment, boiler feed pump, water softener and aerating tower, and forced draft fan. Cummins & Barnard, Ann Arbor, Mich., consultants.

Illinois

CHICAGO—National Aluminate Corp. is asking bids for a one-story, 107 x 125-foot factory addition costing $40,000.

CHICAGO—Chicago Metallic Mfg. Co. has awarded contract to Heidel & Beck, 6235 South Michigan avenue, for an addition to its factory at cost of $40,000. (Noted May 1.)

CHICAGO—Shannon Steel Co. Inc., 4034 South Princeton avenue, has been organized by L. V. Shannon, H. H. Crawford and H. M. Crawford with 4000 shares $5-par stock to deal in iron, steel, tin and other metals.

CHICAGO HEIGHTS, ILL.—American Manganese Steel Co. has let a contract to Campbell, Lowrie & Lautermilch, 400 West Madison street, Chicago, for a foundry addition costing $50,000. (Noted May 29.)

NORTH CHICAGO, ILL.—Abbott Laboratories soon will take bids on a two-story machine shop costing about $50,000. Battey & Childs, North Chicago, architects.

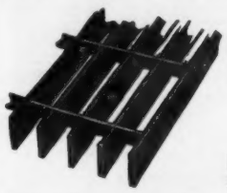
SCREENS of Perforated Metal

The Harrington & King Perforating Co.

5634 Fillmore St., Chicago, Ill.
New York Office—114 Liberty St.

P&H

Serving American Industry Since 1884 — Overhead Electric Cranes and Hoists Crawler Cranes • Electric Motors • Arc Welders • Welding Electrodes.
Harnischfeger Corporation
4411 W. National Ave., Milwaukee, Wis.



TRI-LOK
Grating and Treads
Steel — Aluminum — Brass
No Rivets, Bolts or Welds
Manufactured by
The Tri-Lok Co., Pittsburgh, Pa.
National Distributors
DRAVO CORPORATION, Machinery Division
300 Penn Ave. Pittsburgh, Pa.

H. A. BRASSERT & COMPANY
Consulting Engineers for IRON, STEEL, FUEL and HEAVY METALLURGICAL INDUSTRIES . . . . .
310 SOUTH MICHIGAN AVENUE · CHICAGO

"COWLES"
ROTARY SLITTING KNIVES
for Modern Requirements
Highest Quality . . . . Long Service
The Product of Many Years Specialization
MADE BY TOOLMAKERS
COWLES TOOL COMPANY
Cleveland, Ohio

The
Manufacture of Steel Sheets
By Edward S. Lawrence

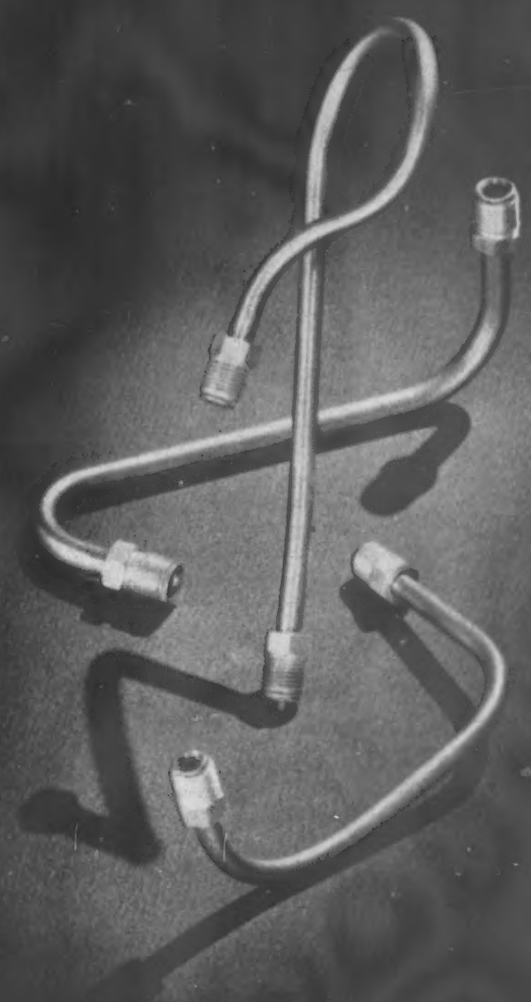
This book has been written in the hope that it may assist in better acquainting members of the engineering and operating staffs of the automotive and allied industries with the principal steps involved in the manufacture of steel sheets

244 pages
116 illustrations

Price Postpaid $4.50 in U.S. and Canada.

The Penton Publishing Company
Book Department
1213-35 W. 3rd St. Cleveland, O. 427-S.

BUNDY TUBING



. . . resists vibration fatigue

BUNDY TUBING CO.
DETROIT

Minnesota

HALSTAD, MINN.—Red River Valley Power co-operative. George Henderson, secretary, is considering construction of about 130 miles additional electric transmission lines. C. J. Halstad, Halstad, project engineer.

IRONTON, MINN.—Village, E. J. Taleen, clerk, will hold election soon on proposal to issue bonds to finance a water filtration plant at cost of about $15,000.

MINNEAPOLIS—Lewis Bolt & Nut Co., F. T. Robertson, vice president, has awarded contracts for a two-story galvanizing plant estimated to cost about $75,000.

Texas

GARLAND, TEX.—Town, J. R. Stultz, representative, has voted bond issue and will make improvements in its water system at cost of $22,000. New pumping equipment is to be installed.

KENEDY, TEX.—Town is making plans to construct a municipal electric distribution system at cost of approximately $100,000.

LITTLEFIELD, TEX.—Lamb County Electric Co-operative Inc. proposes to construct 87 miles of rural electric power transmission lines in two counties at cost of $64,000. H. N. Roberts, Lubbock, Tex., consulting engineer.

McALLEN, TEX.—Central Power & Light Co., Corpus Christi, Tex., is now taking bids for a new pump room and filter bed in its plant.

Kansas

BELLEVILLE, KANS.—NCKRE association will start plans soon for constructing 355 miles of rural electric transmission lines in two counties. Paulette & Wilson, Salina, Kans., consultants.

SENECA, KANS. — Marshall-Nemeha Rural Electrification Service Inc. is preparing to build about 375 miles of rural transmission lines through two counties. Paulette & Wilson, Salina, Kans., consulting engineers.

South Dakota

ALCESTER, S. DAK.—City has started preliminary plans for a sewer system and sewage treatment plant.

WALL, S. DAK. — Wall Commercial club, R. F. Lewis, president, has applied to REA for a $115,000 loan to finance projected construction of 114 miles of rural transmission lines serving 528 consumers.

Iowa

ALDEN, IOWA—Village, C. F. Bigelow, clerk, is considering construction of a complete water softening plant in connection with its water distribution system.

PERRY, IOWA—Osmundson Spade Co. is rebuilding its spade factory, destroyed recently by fire. Total cost estimated at $75,000.

Colorado

DENVER—Reclamation bureau asks bids until July 10 for two 350-ton trolley motor-operated overhead cranes for Grand Coulee power plant at Odair, Wash. Specification 851.

Pacific Coast

BELL, CALIF.—Certificate to conduct business under the firm name of Bell Metal Products, 3605 Gage avenue, has been issued to owner, Walter Nettleship.

LOS ANGELES, CALIF.—Certificate to conduct business under name of Hard Chrome Engineering Co., 1051 East Slauson avenue, has been issued to owners Harris Pierce, Joseph Murray and Charles Turner.

PORTLAND, OREG.—Schmitt Steel Co. has acquired land adjoining its plant and plans to build an addition and install new equipment.

Canada

COBOURG, ONT.—Municipality, W. G. Henderson, manager, plans to build a sewage treatment plant estimated to cost $25,000. Public utilities commission engineers in charge.

HUMBERSTONE, ONT.—International Milling Co. Inc., Minneapolis, proposes to construct a milling plant at cost of $75,000. R. J. Bodman, care of owner, engineer.

HUMBERSTONE, ONT. — Lakeside Foundry Co. Ltd., Port Colborne, Ont., has plans underway for remodeling its plant and installing new equipment at total cost of $40,000.

PORT ARTHUR, ONT.—Canada Creosoting Co. is drawing plans for a new factory costing $200,000 including storage tank and tar products distillery.

BASIC ELECTRIC STEEL
FORGINGS

N.F.& O. Basic Electric Steel produced under rigid metallurgical control is an important *quality* factor in the ultimate forged product

BASIC ELECTRIC STEEL

Carbon, Alloy, Corrosion Resistant and Special Steels Smooth Forged, Hollow Bored, Rough or Finished Machined, Heat Treated to Specifications ...Forging Quality Ingots, Pressed or Hammered Billets.

Die Blocks & Piston Rods

NATIONAL FORGE AND ORDNANCE COMPANY
IRVINE, WARREN COUNTY, PENNA.

OUR AIM is to render service. A little more complete... more hospitable... more pleasing ... than even the most exacting guest expects.

CHAS. H. LOTT
Manager

Every Room Outside with Private Bath
Single from $2.50
Double from $4.00

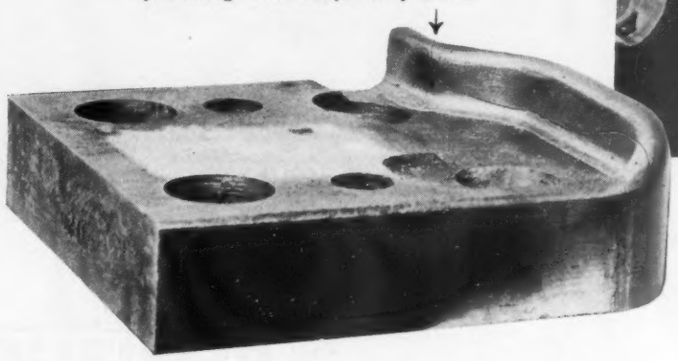
DETROIT LELAND HOTEL

CASS AT BAGLEY AVE.
GARAGE IN CONNECTION

Why steel may crack after Quenching

Often the tempering has been delayed too long

This die is an example of parts which have been spoiled because tempering was delayed for several minutes after quenching. Steel was perfectly sound.



Even with medium-carbon steel it is safest to place the part in the tempering furnace as it is withdrawn from the quenching bath.

THE cracked die, illustrated above, is an example of an error frequently made in heat-treating high-strength parts. Quenching was carried out correctly, but tempering was delayed too long. A brief consideration of quench-and-temper treatment will show why this is true.

Object of quenching a part is, of course, to harden the steel. This great increase in hardness is a result of a change, a refinement, in the structure of the metal that comes about from rapid cooling. However, as an unavoidable result of drastic cooling, another change, entirely physical in its nature, also takes place. Tremendous stresses are "locked up" in the steel—the same sort of stresses that shatter glass if it is suddenly cooled from a high temperature.

Object of tempering or drawing, then, is twofold. It enables the treater to develop the desired combination of strength, ductility and impact resistance by toughening the brittle "as-quenched" steel. Equally important, tempering relieves the high stresses which develop in quenching—stresses so high that they will frequently cause a part to rupture if it is left for any length of time in the as-quenched condition.

Immediate tempering is the only way of overcoming quenching stresses and eliminating the danger of actual or incipient ruptures. By "immediate" is meant before the part has cooled to room temperatures. The steel must be left in the quenching medium long enough for full hardness to develop, of course, but in most grades the refinement of structure has been completed by the time the part has cooled to 200 deg. F. Bethlehem suggests, therefore, that parts be placed in the tempering furnace before they reach room temperature and while they are still between 100 and 200 deg. F.

Danger of rupture and consequent loss of the part is greatest in steels containing a high percentage of hardening elements—carbon, manganese and alloys. However, even medium-carbon steels may be damaged by quenching strains if not tempered immediately. This is especially true of parts with intricate shapes, thin sections, etc.

If you are having trouble with quenched-and-tempered parts, Bethlehem metallurgists can probably be of help. Don't hesitate to call on these men. A request entails no obligation whatsoever on your part.

Because numerous requests for copies of advertisements of this series have been received, reprints of this page have been made available. Simply write Bethlehem Steel Company, Bethlehem, Pa., and state the number desired.

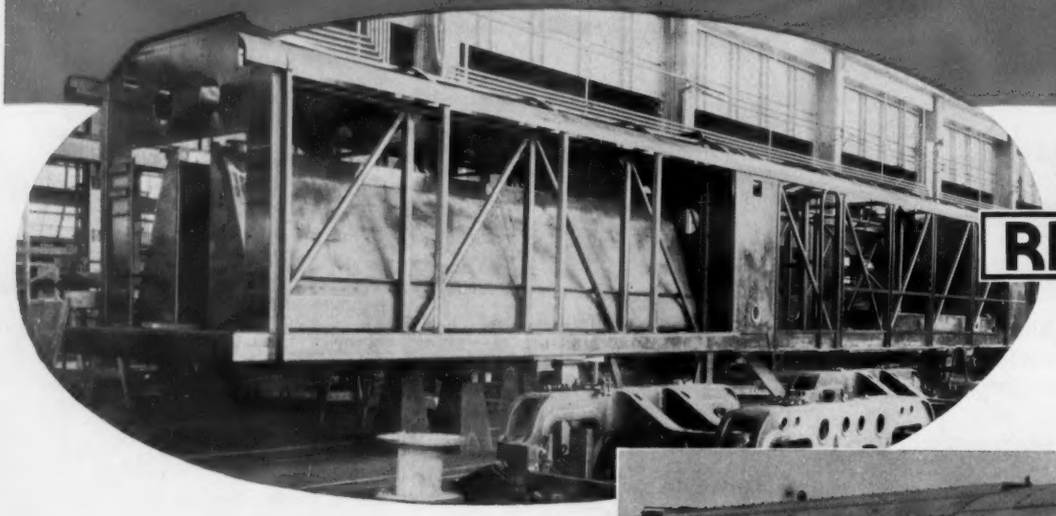
BETHLEHEM STEEL COMPANY

BETHLEHEM STEEL

Vol. 104, No. 26, June 26, 1939, issue of STEEL, published every Monday at Cleveland, O. Entered as second-class matter at the postoffice, Cleveland, O., under act of March 3, 1879. U. S. and Canada: 1 year, $4; 2 years, $6; foreign countries, 1 year, $10; Current issues, 25c.

Light Weight

HIGH STRENGTH MATERIALS



REPUBLIC
STEEL
REG. U. S. PAT. OFF.

Note the formed sections of Republic Double Strength Steel in this construction photograph. Here the locomotive is ready for the installation of equipment.

One of two identical units comprising the new locomotive, capable of either multiple or independent operation. Built in part of Republic Double Strength Steel—this 5000 horsepower steam turbine-electric locomotive is designed to haul a 12-car train. Running between Chicago and the Pacific coast over 2.2 percent grades without a helper, it will operate at altitudes exceeding 8000 feet above sea level and encounter climatic variations in temperature between 40 degrees below zero and 115 degrees above.

REPUBLIC

DOUBLE STRENGTH STEELS

TWO GRADES IN HOT OR COLD ROLLED SHEETS AND STRIP
PLATES • BARS • ROUNDS • FORMED SECTIONS • BOLTS • NUTS • RIVETS

. . . a vital consideration in the design of this radical departure from the conventional form of steam motive power

Nearly two years have been spent by engineers in designing and building this 5000 horsepower Union Pacific steam turbine-electric locomotive. Because of the necessity for saving weight, they followed the modern trend — using new construction methods and specifying high tensile steels.

Republic Double Strength Steels were used in the entire frame in the shape of formed sections, for all braces and also in the sides and roof of this locomotive.

In addition to high strength with less weight, this material possesses an added advantage for railway service in its higher resistance to corrosion, due to its alloy content. Consequently, it not only reduces dead-weight, but cuts maintenance costs in every type of rolling stock.

Technical data on Republic Double Strength Steels will be furnished on request.

REPUBLIC STEEL CORPORATION • GENERAL OFFICES: CLEVELAND, OHIO • ALLOY STEEL DIVISION: MASSILLON, OHIO
BERGER MANUFACTURING DIVISION • NILES STEEL PRODUCTS DIVISION • UNION DRAWN STEEL DIVISION
TRUSCON STEEL COMPANY • STEEL AND TUBES, INC.

OTHER REPUBLIC STEEL PRODUCTS USED BY THE RAILROAD INDUSTRY

ALLOY STEELS • ENDURO® STAINLESS STEELS • TONCAN® IRON • CARBON STEELS • SHEETS • STRIP
PLATES • PIPE • TUBING • BOILER TUBES • CONDUIT • BARS • BOLTS • NUTS • RIVETS
TURNBUCKLES • WIRE ROPE CLIPS • WIRE • WIRE FENCING • FENCE POSTS • TIE PLATES • SPIKES
MANEY GUARD RAILS • CULVERTS • HIGHWAY CROSSINGS • STANDARD STEEL BUILDINGS

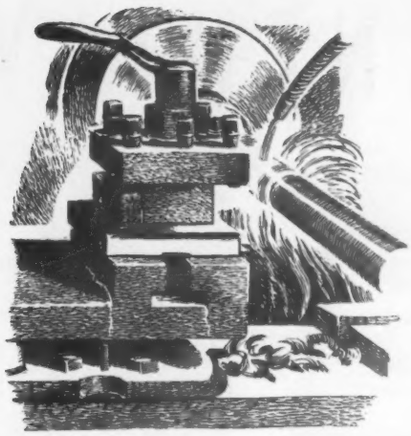
®Reg. U.S. Pat. Off.

When writing Republic Steel Corporation for further information, please address Department ST.

INDUSTRIAL
TYCOL
OILS-GREASES

TIDE WATER

THERE IS A COMPLETE LINE OF TYCOL LUBRICANTS



BUT WASTE FROM MACHINING PARTS went unnoticed here until discovered by TYCOL #655 CUTTING OIL

"The use of white lead and all special thread cutting oils has been eliminated since we switched to TYCOL #655 Cutting Oil – and more important, the quality of all threads has been improved. Cutting speeds are 25% faster.

"Even non-ferrous metals are entirely free from corrosion now. Tarnishing of machined parts is banished 100%. This oil will not oxidize on the metal bed or surface of slide-ways or spindle ways. In fact, it's a fine surface lubricant.

"Where it was formerly necessary to use several different oils to avoid difficulties, we now use TYCOL #655 Cutting Oil in all machines, on all metals and on all classes of work. We have solved all our machining problems with TYCOL #655 Cutting Oil."

Actual savings such as these have caused numerous manufacturers to use Tide Water Cutting Oils. You too may be able to increase production and quality by banishing waste. A Tide Water engineer will gladly assist you and offer practical recommendations to assure better results from your machines.

TIDE WATER ASSOCIATED OIL COMPANY

TIDE WATER DIVISION, 17 BATTERY PLACE

New York, N. Y.

TRANSPARENT
NON-TARNISHING
SULPHURIZED

CUTTING OILS

SCIENTIFICALLY ENGINEERED FOR EVERY INDUSTRIAL USE

PERMANENTLY MODERN

. . . *because the enameling base is*

MICHIGAN METAL

Michigan Metal meets today's high standards of quality because it was developed by men who understand the enameling industry's requirements. Smoothness, freedom from flaws which would mar the finish, porousness to make the enamel adhere, ductility to permit severe drawing and forming operations, and weldability—all these are widely recognized properties of Michigan Metal.

Write for complete information about Michigan Metal—the better base for modern products.

MICHIGAN METAL
SCORSE, DETROIT
ENAMELING SHEETS
NATIONAL STEEL

GREAT LAKES STEEL CORPORATION

DETROIT, MICHIGAN

DISTRICT OFFICES: *Boston*, 1001 Statler Building; *Buffalo*, 1000 Walbridge Building; *Chattanooga*, Hamilton Bank Building; *Chicago*, 1026 Builders Building; *Cleveland*, 820 Leader Building; *Dayton*, 846 Third National Bank Building; *Indianapolis*, 1215-17 Circle Tower; *New York*, 405 Lexington Avenue; *Philadelphia*, 407 Liberty Trust Bldg.; *St. Louis*, 3615 Olive St., *San Francisco*, 824 Sharon Bldg., *Toledo*, 906 Edison Bldg.

Division of
NATIONAL STEEL CORPORATION

READER Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Low Price Will Broaden Use

To the Editor:

I read Mr. Hartford's article with interest. (STEEL, June 12, p. 23.) There are a few comments that I should like to make. I am very doubtful that the direct reduction of iron ore by any method other than the blast furnace is going to be commercially feasible. Ore conditioning and beneficiation will entrench the present modern blast furnace still more firmly as the method of producing iron. Neither am I in sympathy with smaller units for producing products at slower speeds. The steel industry is a tonnage industry and I feel we should keep it so.

Only in the coal mines can I foresee any major change in the industry which could be compared in any way with the changes brought about by the installation of continuous strip mills. I believe that the next few years will see, through increased mechanization, as great a change in mining methods as the last few years have seen in the production of sheets.

The tremendous factor of labor cost is going to accentuate the elimination of labor, and labor-saving devices of all kinds will undoubtedly be a prominent part of capital expenditures for the next few years. This is unfortunate but on the other hand steel is a cheap, tonnage product and the public and the government seem to want a low-price product. If the industry can bring about lower steel prices the volume of steel used should increase and any labor displaced in the steel mills should be made up many times over by the additional uses of steel, due to its price advantage over many other commodities.

Standardization of products should further simplify the production of large tonnages and this is an item that must and will be given major consideration in the near future, I am sure.

C. M. WHITE

Vice president,
Republic Steel Corp.,
Cleveland

Too Many Furnaces Obsolete

To the Editor:

Referring to R. L. Hartford's article, our particular slant on this picture would be built around our experience and acquaintance with the furnaces used in the manufacture of steel.

The majority of furnaces used today were designed and built with the quality of steel used ten years ago in mind.

Today there exists an entirely different situation, in that the consumer demands a quality of steel that was not considered commercial ten years ago. The use of obsolete and semi-obsolete furnaces always means a compromise with quality as well as increased cost of production.

Steel is being put to wider uses every day, and largely because of improved quality.

Modernization of existing obsolete and semi-obsolete furnaces will go a long way toward reaching the high standards of steel quality demanded today, and at the same time provide a proper tool for the metallurgist to accomplish the required purpose.

P. M. OFFILL

Vice President,
Amsler-Morton Co.,
Pittsburgh

New Research Aim Needed

To the Editor:

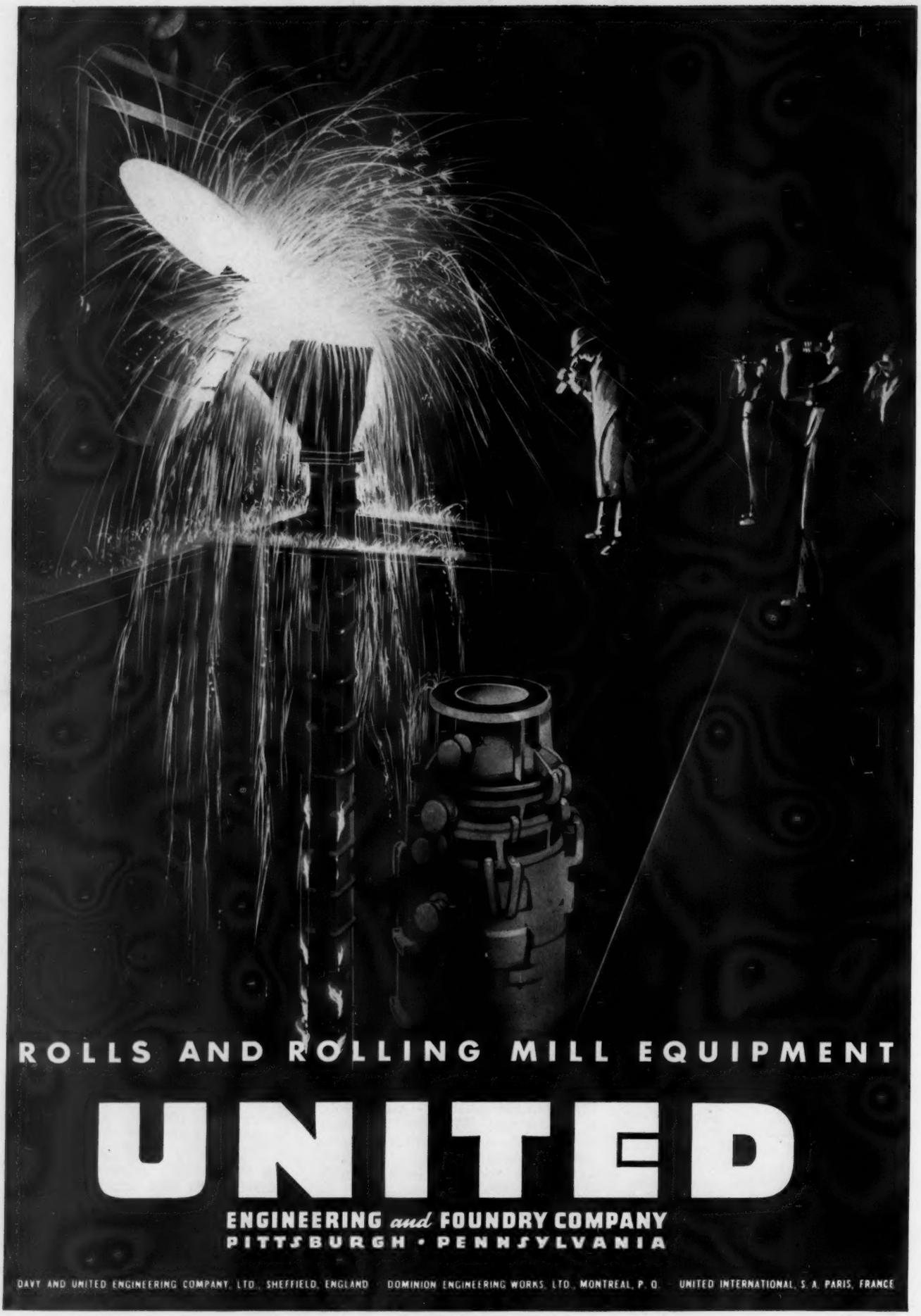
With all due respect for the billions of dollars of invested capital the steel industry represents, I still feel that the industry as a whole has handled its research and development rather poorly. Not as well, for instance, as the automotive industry, the chemical industry, the electrical industry, to name a few.

Steel industry research and development consists mainly of trying to keep up with customers' demands for something the industry cannot make profitably. The industries who do well and earn profits commensurate with the capital invested in them spend their research energy and their development dollars finding what they can make and sell profitably. The difference is just enough to account for the difference in profits realized.

It is not too late by any means for the steel industry to orient its policy from one which invariably leads to no profits to one which has proven to be conspicuously successful in earning profits.

ROBERT E. KINKEAD

Consulting Engineer,
Cleveland


ROLLS AND ROLLING MILL EQUIPMENT
UNITED
ENGINEERING and FOUNDRY COMPANY
PITTSBURGH • PENNSYLVANIA
DAVY AND UNITED ENGINEERING COMPANY, LTD., SHEFFIELD, ENGLAND
DOMINION ENGINEERING WORKS, LTD., MONTREAL, P. Q.
UNITED INTERNATIONAL, S. A. PARIS, FRANCE